



Prostate Cancer Health and Fitness Online:  
The Development and Pilot Testing of an Internet Physical Activity Program for  
Prostate Cancer Survivors

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## ***Thesis Abstract***

Globally, prostate cancer is one of the leading causes of older male mortality and morbidity. Following treatment, these men have a reduced quality of life, often with lasting physical (e.g., incontinence, impotence and physical decline) and psychological (anxiety and depression) sequela. Supporting participation in physical activity can assist to mitigate these issues. However, most prostate cancer survivors do not participate in the recommended 150 minutes of moderate to vigorous physical activity and two-resistance training sessions per week. As Internet access and technology adoption increase in older populations, one method to support physical activity levels is via online computer-tailored programs. These programs algorithmically provide a unique combination of messages to an individual. These are based on pre-measured behavioural, psychological, and demographical characteristics. This increases the message personalisation, leading to greater cognitive internalisation of the messages, and enhancing behaviour change outcomes.

While computer-tailored programs have shown promise, non-usage attrition and disengagement can compromise efficacy. To potentially improve engagement, one understudied aspect is a program's website architecture. That is, the manner in which the participant receives and interacts with the program. Computer-tailored programs usually provide small packages of information in set schedule (e.g., daily, weekly, fortnightly etc.) over a set period time. This is known as linear 'tunnelling' and is a standard approach to computer tailoring. However, Self-Determination Theory suggests that this may reduce participant intrinsic motivation by limiting user autonomy. Therefore, programs that promote autonomy could improve engagement, and therefore impact efficacy. To test this concept, two computer-tailored interventions (standard tunnel versus free choice) were systematically developed and compared in a 3-armed randomised controlled arm trial. The trial also contained a non-tailored control for secondary outcome comparison, including perceived acceptability, usability and relevance, changes in physical activity levels (aerobic and resistance), as well as overall study feasibility.

This thesis by publication contains manuscripts pertaining to the systematic development of (three manuscripts) and evaluation (one manuscript) of the computer-tailored interventions. The trial was marketed as *Prostate Cancer Health and Fitness* online (PCHF). Chapter 1 provides the background literature; thesis aims and hypotheses. Chapter 2 reports the results of a systematic review that assessed previous behaviour change interventions and efficacious study characteristics. Chapter 3 is the manuscript for a qualitative investigation. This study asked prostate cancer survivors to provide written feedback on four non-tailored health promotion messages to identify potential tailoring factors (i.e. what is missing from the message). Chapter 4 provides the results of semi-structured interviews with prostate cancer survivors. The aim of this qualitative study was to analyse themes on topics of ‘prostate cancer’, ‘physical activity’ and ‘Internet use’. This was also used to identify preferred website features from participants, and the findings influenced the design of PCHF. Chapter 5 outlines the main findings of the 3-armed randomised controlled trial testing the two versions of the PCHF intervention to the non-tailored control. Finally, Chapter 6 broadly discusses key thesis findings and overall contribution to research, thesis strengths and limitations, as well as the implications for future research and clinical practice within prostate cancer survivorship.

## ***Originality and Publication Declaration***

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I acknowledge that copyright of published works contained within this thesis resides with the copyright holder(s) of those works. I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time. I acknowledge the support I have received for my research through the provision of an Australian Government Research Training Program Scholarship.

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~ It takes a village to raise a thesis ~

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### *General Practices*

Arkabar GP Clinic

Regency GP Clinic

Playford GP Super Clinic

Blackwood Family Practice

Blackwood Clinic

Uni SA Health Clinic

Uni Care Adelaide

Klinccraig Clinic

Kingswood Practice

## Dedication

I wish to dedicate this to the men and their families who are living with, know or have known someone who has been diagnosed with prostate cancer.

An enormous thank you to the prostate cancer survivors who participated in my PhD.



## *Chapter Outline*

Chapter 1:	Background literature review relating to prostate cancer, physical activity and computer-tailored and online programs. This chapter also contains the thesis aims and hypotheses
Chapter 2:	A systematic review of physical activity-based behavior change interventions reaching men with prostate cancer
Chapter 3:	Exploring prostate cancer survivors' perceptions of non-tailored physical activity messages: Implications for computer-tailored interventions
Chapter 4:	Going online? Perspectives from prostate cancer survivors for designing online computer-tailored physical activity programs
Chapter 5:	How does the architecture of a computer-tailored physical activity website impact engagement in among post-treatment prostate cancer survivors? A randomised controlled trial
Chapter 6:	Discussion and conclusion of thesis.
Appendix A	Free choice module concept book
Appendix B	Tunnelled intervention module concept book
Appendix C	Website screen shots

## Contribution to Discipline

### *Thesis Publication*

Finlay, A., Wittert, G., & Short, C. E. (2018). A systematic review of physical activity-based behaviour change interventions reaching men with prostate cancer. *Journal of Cancer Survivorship*, 1-21.

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## ***Chapter 1***

Background, Aims and Hypotheses



## The Burden of Prostate Cancer

Prostate cancer is one of the leading causes of male mortality and morbidity within developed nations (1, 2). Incidence is high and steadily increasing, with 1.27 million cases of prostate cancer reported worldwide in 2018, and an excess of 2.2 million cases expected by 2040 (2, 3). While prostate cancer is the second most leading cause of male related cancer death in men (after lung cancer (2)), survival rates are improving due to early detection and advances in treatment (2). The 5-year prostate cancer survivor rate differs between countries, and usually ranges between 40% to over 90% (4). The growing incidence and high survival rate of prostate cancer has led to a steady growth in the number of prostate cancer survivors worldwide.

Cancer survivorship encompasses many changes to an individual and their families. This often results in a reduced quality of life (5, 6), and can require ongoing health monitoring with medical practitioners (7). This may include the monitoring of blood markers (prostate specific antigen or PSA), prostate core biopsies, long-term cancer treatment (e.g. hormone injections/ pills) or potentially secondary cancer treatment (7). Survivorship may also encompass long-term physical and psychological changes from prostate cancer treatments. In localised prostate cancer, physical changes frequently result from nerve damage from surgery or cell-based damage from radiotherapy, often resulting in long-term fatigue, incontinence, bowel issues, and impotence (8). Men diagnosed with advanced prostate cancer may require hormone therapy, also known as androgen deprivation therapy (ADT) (9). This can have severe side effects including mood swings, lethargy, weight gain, hot flushes, the development of breasts, loss of bone density and reduced physical functioning (9). For example, one study found that prostate cancer survivors receiving ADT had almost 24% less muscle strength compared to age-matched controls (10). Prostate cancer survivors' psychological distress can be high, with distress reported in 10% to 40% of patients (11, 12), contributing to a higher risk of suicide compared to men without cancer (13). Suffice to say, many of these men may need support in order to not only survive their prostate cancer, but to thrive.

## The Importance of Physical Activity

Supportive and holistic care for prostate cancer survivors is multidisciplinary and broad in nature. It covers not only aspects of clinical monitoring and potential further management of the disease and any treatment side effects, but also spans into strategies to improve quality of life (7, 14-16). A promising way to do this is to promote participation in physical activity (17-21). Physical activity has benefits for both physical and mental health (18). Furthermore, physical activity tends to be accepted by prostate cancer survivors as it fits within masculine ideas of strength and independence (22, 23).

The evidence for exercise and its effects on cancer survivorship is mounting, including evidence for men with prostate cancer (24, 25). Randomised control trial level evidence has shown that increasing participation in physical activity is beneficial for improving both physical and psychological health outcomes for men with a history of prostate cancer (17-21). This includes improvements in physical functioning, bone loading, muscle strength, and increases in overall wellbeing and quality of life (18, 25-30). Physical activity can also assist the mitigation of bone and muscle loss, fatigue, weight gain and mood related issues for those on hormone therapy (21, 31-33). Longitudinal and observational evidence suggests that long-term engagement with physical activity may also improve sexual functioning (34), and there is some evidence for a decrease risk of all cause and prostate specific mortality (35, 36).

In general, the guidelines for oncology based physical activity include avoiding inactivity and the promotion of both aerobic and resistance training for cancer patients. For example, established American oncology guidelines suggest that individuals with cancer should aim for 150 minutes of aerobic moderate to vigorous physical activity (MVPA) and at least two resistance sessions (37, 38). In Australia, the national oncology guidelines promote supervised exercise, with 150min of MVPA, and 2-3 intense resistance-training sessions (28). In the UK, specific exercise guidelines are suggested for 12 weeks of supervised exercise at least twice a week for men on hormone treatment Androgen deprivation therapy (ADT) (39), though general physical activity advice promotes half an hour on 5 days or more a week (40).

Despite the clear benefits and recommendations of physical activity in cancer survivorship (25), the majority of prostate cancer survivors are not sufficiently active. Prostate cancer survivors' overall adherence to the physical activity guidelines is therefore unsurprisingly low (34). A review by Thorsen et al. (2008) found that guideline compliance for aerobic activity tends to be around 50-60% (34). In 2015, an Australian study by Galvão and colleagues indicated that of a survey of over 400 prostate cancer survivors, only 12.3% were meeting both the aerobic and resistance training guidelines (41). Previous research suggests that biological, psychological and social factors contribute to inactivity among men with prostate cancer (42-51). For example; fatigue and pain (42), incontinence, fear of incontinence in public and the need to be near a toilet, and time constraints have all been identified as barriers for physical activity (46, 47, 49, 50, 52). These barriers can reduce a prostate cancer survivor's motivation, self-efficacy, and capacity to participate in physical activity (43, 47), and may require acceptable and appropriate behavioural support. As the number of cancer survivors are predicted to increase (2), so too will the demands for support and behavioural interventions. This is where online interventions can assist.

## Online Physical Activity Interventions

There are many methods to provide a behaviour change program via technology. This might be through mobile phone text message reminders, telephone support, online games, websites (static or tailored to personalised content), notifications on mobile / tablet-based applications, mobile apps, social media and wearable trackers (53). Bibliographic analysis suggests that there have been over 1000 studies to date investigating the use of online interventions for promoting lifestyle changes (53). This increasing popularity is likely due to the recognised wide reaching, cost effective, and flexible nature of this form of support, coupled with the capacity to increase the personalisation of interventions (53). Smart phone apps, for example, are a common method to provide personalised behavioural support (54). Mobile phone ownership has been ever increasing in recent decades, including uptake from older adults (55-58), thus providing opportunities for health promotion 'on the go' (59). Some researchers have explored the acceptance and use of commonly available physical activity mobile apps

for cancer survivors (60-62). For example, Roberts et al. (2018) interviewed cancer survivors regarding publicly available exercise apps and found that, while not 100% perfect, commonly available mobile apps were generally acceptable, and could potentially be adapted to increase the relevance of material for cancer survivors (61). Short and colleagues (2018) successfully piloted a mobile app referral system using physiotherapists who recommended publicly available mobile physical activity apps to a mixed sample of cancer survivors (60).

Furthermore, wearable exercise trackers, along with the corresponding tracking mobile application have also been considered appropriate for those with cancer (63, 64), and in themselves, are effective (65). While this research has been of benefit, it should be noted that mobile apps might not be suitable, or even preferred for all persons and in all contexts (59, 62, 66). That is, mobile apps can be cumbersome and frustrating for some older adults. Specifically, due to size and poor design, apps cannot often support degenerating eyesight or poor physical hand dexterity (55, 66). Furthermore, mobile apps can be more expensive than websites, often averaging just under half a million dollars to design and maintain (67). This has implications for sustainability of health promotion programs into the future, given that less than 10% of research programs enter the market. (67).

When it comes to readability and internalisation of health messages, computer-based websites in physical activity promotion tend to fair better than those on mobiles (59). This might be because those persons on mobile devices can be more easily distracted and may not internalise the health messages properly, therefore influencing the likelihood of behaviour change (59). Furthermore, cancer patients have reported a higher preference for cancer support via computer-based websites (27.9%) compared to smart phone app support (8.6%) (62). Websites have been somewhat efficacious in both the general population (68-71), and for those with chronic conditions including cancer (72-74). However, the application of websites for behaviour change in cancer survivors is still relatively new, despite reports indicating a preference for online support (62, 63, 75).

## Online Cancer Physical Activity Interventions

A recent cancer systematic review found 15 online interventions targeting cancer patients and their level of physical activity (74). The review identified significant gains in behaviour change, with a pooled average gain of 41 minutes in moderate-vigorous activity per week (74). Several of the studies included participants with any form of cancer, whereas others focused on individual cancer groups, or specific cancers (i.e. only targeting prostate and colorectal, or focused on prostate cancer only). For those studies targeting mixed groups of cancer survivors, no study reported results specifically about men with prostate cancer. Indeed, prostate cancer online interventions in both behavioural and general supportive care have had less attention to date compared to other cancer research (76).

For example, one recent review by Forbes et al (2019), examined all digital or online interventions for supportive care in prostate cancer (76). The review identified only 16 studies focusing on men with prostate cancer, and most were treatment decision aid tools, indicating that the field is still in its infancy. Since the publication of this review, three studies focusing specially on using online methods to support men with prostate cancer and exercise have been published. These online physical activity studies were targeting sedentary prostate cancer survivors on hormone treatment (N = 46) (77), prostate cancer survivors (N = 76) (78), and one study with a mixture of prostate cancer (61%) and colorectal cancer (39%) and mixed cancer (N = 478) (79).

These online website based interventions were 12 weeks in length, and used different frequencies and methods of support in order to promote physical activity to men with a previous diagnosis of prostate cancer. The Trinh et al. study (known as RiseTx; (77)) was a feasibility study that focused on supporting Canadian men with prostate cancer on hormone therapy to increase their step count and reduce the level of sedentary behaviour during the day. This was completed by combining a daily wearable tracker (Jawbone) with a website that was designed for daily logins (77). The study was set to increase the participant's step count by 3000 steps by weeks 7-9 compared to baseline. Participants received daily support from a wearable tracker to prompt movement after 30 mins of sitting, as well as rewards to log into the study website. RiseTx was aerobic focused, and successfully increased participant's step count by an

average of 1535 steps from baseline to post intervention ( $p < 0.001$ ) and successfully reduced sitting time using the Jawbone data compared to the control group. However, this study did not tailor the online content to meet individual needs, which is more efficacious than non-tailored information (80). Nor did this study promote strength/resistance training advice or data collection, which is part of the oncology guidelines and recommended for those on hormone treatment (81).

In contrast, the feasibility, acceptability and short-term outcome study promoting lifestyle changes to prostate cancer conducted by Kenfield and colleagues (Prostate 8) was more complex (78). This study was a multiple behavioural lifestyle study, and gave advice on six diet recommendations, one section on smoking cessation and one section on physical activity promoting vigorous aerobic minutes per week with some supplementary material on resistance training. The intervention used a combination of interventional elements, including a wearable tracker (Fitbit), a website that gave advice based on the components of the 8 areas of behaviour change that required intervention. This included information on diet, exercise, smoking and finding support. The intervention also provided emails once every two weeks with encouraging recipes and general blog posts, as well as 4 to 5 mobile phone text based supports per week. While resistance activity was not reported as an outcome, this study reported a significant though small change of +9 mins pre/post for moderate to vigorous physical activity in the intervention group, compared to – 6 mins of the control as measured by an accelerometer. The changes in step count were more substantial, with the intervention group increasing their steps by +849 steps per day compared to the control group with decreases in their step count by an average of – 978 steps per day between the baseline and end of intervention.

Finally, Golseijn and colleague's study (Oncoactive, N=478) used a computer-tailored online website (with pedometer) to support colorectal (39%) and prostate cancer survivors (61%) to increase their physical activity. Participants received personalised advice once a month for three months based on answers to questions regarding theory-based constructs (e.g. self-motivation, attitude and intrinsic motivation). The outcomes of moderate to vigorous activity in the intervention group were compared to a wait list control. The study collected data at baseline, at the end of the 3-month intervention period and at 6 months from baseline. The study found

significant though moderate increases in the self-report and objective activity graph data in the intervention group at 3 months (still during intervention) and at 3 months follow-up post intervention compared to the usual care wait list control. In the analysis, both education and cancer type (favouring colorectal cancer) moderated physical activity gains.

Overall, these three studies have demonstrated that online physical activity programs for prostate cancer individuals can be acceptable and feasible to deliver (77-79). However, none of these studies promoted resistance training at this point, with future studies looking at filling this gap (78). This is an important component of many oncology guidelines, particularly for those on hormone treatment (28, 37, 40). Furthermore, two of these interventions used wearable trackers with the associated tracking app (77, 78), which in themselves, are efficacious at generating behaviour change (65). By implication, the results from these studies make it difficult to infer what elements of the website could be influencing participant behaviour separate from the influence of the tracker apps. This is important, as the capacity to upscale these forms of online support from small pilot tests to large-scale public health programs would be limited by the financial capacity to supply participants with fitness trackers. The Oncoactive study had a much broader reach, with over 450 participants. However, the outcomes and baseline data reported mixed cancer aggregate scores (79). Therefore, the impact of this computer-tailored intervention on prostate cancer survivors is unclear (79).

With little more than a hand full of studies in online physical activity promotion for prostate cancer survivors, there is significant room for exploration. The previous studies, in addition to other studies of online support (76), indicate that online interventions are feasible and are acceptable to prostate cancer survivors. However, research is needed to explore and improve the understanding of how differences in online interventions could affect prostate cancer survivors to improve their physical activity levels. That is, what aspects of online intervention lead to greater engagement with an online intervention and ideally impact behaviour. Similar to the method used by Oncoactive, one avenue worth exploring further would be to utilise computer-tailoring methods within website design due to its capacity to provide automatic personalised support.

## Computer Tailoring

Computer-tailored programs are a subset of technology driven interventions. They are considered to be acceptable, feasible, and efficacious at promoting behaviour change (82-84). The same way in which a clinician would tailor their information to a given patient based on their needs and circumstances, computer-tailored interventions do this using technology. The tailored component means that the messages are mapped to an individual's demographical, social, psychological or behavioural profile, and are therefore more persuasive than non-tailored or generic messages due to increased personal relevance (80, 84).

The concept of tailoring is theoretically grounded in the Elaboration Likelihood Model (ELM) (85). Briefly, the ELM stipulates that there are two psychological pathways to persuasion that are known as the 'central route' and the 'peripheral route'. The central route is more analytical in nature, requiring deep cognitive thought processes, whereas the peripheral route relies on persuasion that targets feelings and heuristics (85). It is theorised that when messages are more relevant to the user, they steer a participant closer to a central route of persuasion. This leads to greater attention and internalisation of the message, thus leading to greater behaviour change (80, 83, 86-88).

Computer tailoring is a multifaceted process, and there are detailed and systematic guidelines available for health professions to follow (89). In summary, at the beginning of a computer-tailored program, participants answer a series of questions in the form of a survey or quiz. This might be completed by asking participants for demographic questions, or by presenting discrete choice scenarios. The participants then receive messages relevant to those answers. The messages are linked through a series of "rules" (known as IF THEN statements or algorithms). For example, IF a participant selects option 'A' to question 1, THEN show message 1, IF they choose option 'B' THEN show message 2 etc. Users will complete these surveys at various time points within the intervention. Traditional computer-tailored interventions use 'tunnelling' techniques. This is a logical step-by-step structure that provides small packages of tailored behaviour change information over time in order not to overwhelm the participant and guide them through the behaviour change process (90-92). This method



has been used to great effect in modular based programs that deliver the program over time (83, 93).

In general, the level of tailoring specificity may differ in each intervention based on the requirements of the program designers (see Kreuter 2013 (89)). Participants might receive different newsletters or websites, pictures or text. The text itself may be tailored at a paragraph, sentence or word level that is either not dependent (i.e. a single introduction module) or dependent (feedback relies on previous weeks data) in nature. However, the program algorithms become increasingly complex to create when multiple variables are incorporated. This can make tailoring time consuming and resource intensive, and there is little evidence to suggest at what extent tailoring should occur to achieve meaningful results. When determining the variables of which to tailor, guidelines suggest examining known behavioural and theoretical determinants (53). In physical activity behaviour change literature, many previous interventions turn to theoretical (such as Social Cognitive Theory, or the Transtheoretical module) and determinants of the intended behaviour (level of education, age, self-efficacy, social support, baseline behaviour, motivation, barriers etc.) to drive tailoring decisions during the intervention design process (53, 87-89, 93). For example, Taylor Active, a computer-tailored online physical activity intervention (53) used Social Cognitive Theory, and incorporated modular feedback based on theoretical components.

Once variables have been considered, the level or number of or layers of messages may change depending on the intervention designers' level of experience, resources and project time and application of theory (see Kreuter 2013, 89). Using Taylor Active again as an example contained two layers of tailored including messages for 'obese' and 'not obese' categories for those who picked the goal of 'weight loss'. In this tailoring variable, each group received a different message that provided slightly different advice based on evidence for physical activity and weight loss. Taylor Active designs could have theoretically split the message further into BMI levels and weight loss goals, and each group with this goal could have received a slightly different message. However, designers have to prioritise their messaging and tailoring strategy. Each level of tailoring takes time to develop, and there is little evidence as to how to optimise the number of layers within a given tailoring variable. In addition to general physical activity determinants, cancer based tailored interventions may need to provide

additional tailored physical activity advice based on cancer specific sequela, such as addressing anxiety and fear or recurrence, loss of function, cancer related fatigue, level of incontinence, pain, lymphoma) or additional information about physical activity and its effect on cancer (17, 22,23). Additionally, when applying interventions to improve physical activity based self-efficacy, interventions could tailor to known changes in motivation, such as regaining control over one's life and improving male based self-image post prostate cancer treatment (17, 22,23).

## Engagement in Online Interventions

One of the main issues identified in online intervention is the challenge of engagement with users. Engagement in online interventional contexts has been broadly defined as the process in which individuals interact with the intervention as either behaviour (use or adherence) and/or the psychological affect of the program (94-96). It is thought to impact online intervention effectiveness by influencing the depth of involvement with the behaviour change process (e.g., effort and attention towards set goals) (95). It includes how a user might internalise the health messages and for how long, thereby impacting on real world behaviour change (96). In recognising the inextricable links between engagement and intervention efficacy, there have been increasing calls to consider more deeply how the user experience and actual usage of the program could be optimised to enhance engagement (94). The loss of online engagement in a program is often called non-adherence and non-usage attrition. Non-adherence refers to the proportion of users that do not utilise the intervention as intended by developers. Non-usage attrition refers to the pattern of use where fewer people interact with the intervention over time (94, 97), even in those with computer-tailored techniques (83, 91, 98). According to Kelders (2002) systematic review of 83 online health interventions, which included lifestyle and physical activity interventions non-adherence rates tended to be around ~50% (91),

While non-usage and non-adherence may not necessarily indicate a lack of engagement (for example, some users may have stopped using the intervention because their needs are met but they are still engaged in the behaviour change process), it does signal that intervention design is often at odds with user needs or circumstances. Both non-usage and adherence have both been associated with lower intervention efficacy

(83, 94, 97, 99). While the association between usage and efficacy may be driven by factors outside of intervention components (e.g., more motivated users being more likely to complete the program and more likely to change behaviour independently), it may also be a dose effect. In cases of non-usage attrition for example, exposure to persuasive behaviour change techniques and information presented in the later parts of a program is compromised due to participant drop out. How to design interventions that encourage and ensure engagement with key working mechanisms is a key concern in the field (95).

Unfortunately, there is very little optimising engagement literature available for program designers. There has been some exploration into factors that impact engagement and efficacy in online behaviour change interventions. This has included exploring participant factors (e.g. motivation levels for behaviour change), design aspects (e.g. participatory input during design, application of behaviour change theories, preferred features of online interventions) and behaviour change techniques utilised. In older adults, for example, the most effective strategies were reported as behavioural goal setting, promoting self-monitoring, planning for behavioural relapse and providing feedback on performances (100). Additionally, interventions that boost self-efficacy, a key component of social cognitive theory (101), are likely to be associated with behavioural change in both older adult (102), and cancer based settings (103). However, even with the application of these techniques and theories in online settings (54, 104, 105), there are still issues with engagement (94, 96). One theoretical aspect that has received less attention is to promote autonomy within the online interventions.

## Autonomy in Online Interventions

Yardley and colleagues describe that in order to create more person-centred approaches to online behaviour change interventions, programmers should create more opportunities for autonomy and thereby impact participant engagement (106). Meeting the need for autonomy within digital interventions is in line with Self Determination Theory (SDT) (107). SDT is a behavioural motivation theory that links behaviour, function and personality underpinned by empirical data and a meta-theory (107). Primarily, SDT focuses on behavioural motivation through intrinsic or extrinsic means.

Intrinsic motivation is motivation driven internally. This might be through values, and /or through personality and creates behaviour that is motivated by enjoyment and satisfaction. Extrinsic motivation is behaviour that is motivated by external values to the individual. For example, this might be through compliance, cooperation, rewards and punishments, or motivated by guilt, or shame at what others may perceive about the individual and their behaviour (107).

SDT notes that behaviours that are longer lasting are likely due to the behaviour becoming intrinsically motivated. In physical activity behaviour, this might be that if one enjoys exercise one is more likely to participate in the activity and create lasting change, as compared to feeling guilty for not exercising or only exercising in order to lose weight (108). Intrinsic motivation is also supported by three other theoretical components of SDT. This includes underlying needs of autonomy/control, relatedness and competence. Autonomy is that the perceived agent of change is within the self; relatedness is part of the need to be connected with others; and competence is the need for individuals' skills to be adequate enough to undertake the behaviour within the environment (107). In physical activity research, behaviour change that is linked to intrinsic motivation is associated with longer lasting behaviour change (108) and encouraging participants to move from extrinsic motivation (i.e. I exercise because I feel pressured by others) to intrinsic motivation (i.e. I exercise because I enjoy it). This might be through the intervention meeting a participant's need for autonomy by supporting participants to taking control of the behaviour), relatedness (encouraging social support, reading about other stories, interacting with other participants), or by increasing participant's competence to exercise. It may be that when user control in an online intervention is high, then intrinsic motivation to engage with an intervention is increased, and by proxy the behaviour change.

Most online interventions have the capacity to offer some level of autonomy to participants when choosing how to implement advice provided (e.g. participants' choosing their own fitness goals) (106). However, within programs that are tunnelled in nature, the manner in which individuals receive the information lacks flexibility and therefore autonomy (92). Perhaps allowing a more self-paced and self-tailored approach may assist participants to interact with the navigational components of a program to meet the need for autonomy (106). This could be facilitated by changing the website

architecture (92, 109) and allow individuals to pick and choose what components of the intervention they interact with. This might impact favourably on the behavioural and psychological aspects of engagement, and potentially physical activity behaviour (96). By allowing the freedom to choose, participants will be able to self-tailor the information, thus making the intervention more relevant to them than a pre-determined algorithm could (96). According to the ELM model, increased relevance should result in more elaborate processing of the information via the central persuasion pathway. According to SDT, this more autonomous approach should also increase intrinsic motivation for using the intervention, which may also improve how the messages are internalised. However, there are also some potential disadvantages of this approach. A free choice program could potentially be overwhelming and a participant may not know where to start. This might be impacted through hesitation to learn new technology (55), or due to other issues such as cancer related fatigue impacting on cognitive capacities (110). In these cases, a step by step approach, known as ‘tunnelling’ for a new behaviour might be more appropriate (111). This form of programming is designed to provide small amounts of information delivered over time in order to not overwhelm the participant (92).

Interestingly, while tunnelled versions are trying to mitigate cognition over load, this might be in conflict to user preference. There is already some preliminary evidence that prostate cancer survivors prefer a free and autonomous website layout (112), and that online physical activity programs are feasible and acceptable to prostate cancer survivors (76, 77). However, the impact of website architecture design choice within a computer-tailored intervention has not been explored in a controlled setting with this demographic. Furthermore, the exploration of website architecture on behaviour within computer-tailored settings have not been directly compared to date (92, 109). This is important, as this exploration may impact on the level of engagement perceived by participants and thus support design aspects of future programs. Given the previous lack of website architecture experimentation, and the overall infancy of the online and prostate cancer field, this thesis was designed to contribute interesting and significant findings to the computer-tailored and behaviour intervention research community.

## Thesis Aims and Hypotheses

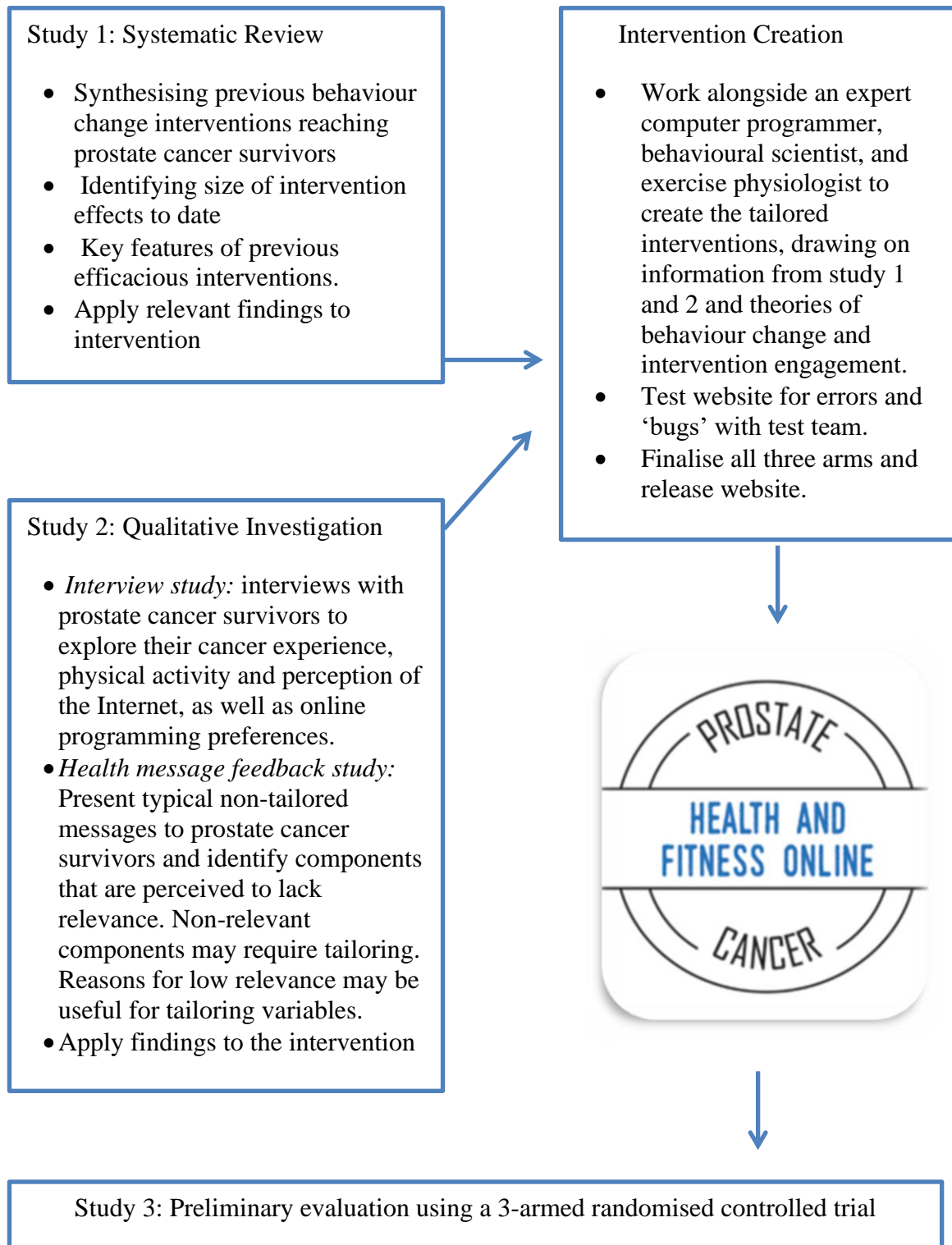
Overall, this thesis aimed to develop compare an online free choice computer-tailored intervention and compare its performance to a standard tunnelled computer-tailored intervention and non-tailored control. The two first thesis aims relate to the evidence-based development of the intervention, and the final aim relates to the preliminary evaluation of the intervention. There is a thesis and intervention development chart flow chart on the following page to allow clarification as to how each study contributes to the overall thesis design.

- Identify efficacious factors of previous physical activity behaviour change programs targeting men with prostate cancer and identify strategies to support behaviour change.
- Use qualitative investigation to identify opportunities for tailoring and preferences for the website design in order to assist and guide the design of the computer-tailored program.
- To evaluate differences in acceptability, engagement and preliminary efficacy between an autonomy computer-tailored intervention, the standard tunnelled computer-tailored intervention and non-tailored control.

In relation to the third aim, this thesis contains the following hypotheses:

- Participants in the free choice arm will have higher scores in both behavioural (number of physical activity modules completed) and in affect (12-item e-health engagement) based engagement compared to participants in the standard tunnelled intervention arm.
- A similar pattern of results will be observed for all other study outcomes, with more favourable acceptability and behaviour change outcomes observed in the free choice arm compared to the standard tunnelled arm.
- Participants in both tailored intervention arms (free choice and tunnelled) will report more favourable intervention outcomes related to acceptability and behaviour change than participants allocated to the control non-tailored intervention arm.

## Intervention Development and Evaluation Flow Chart



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## ***Chapter 2***

### **A Systematic Review of Physical Activity-based Behaviour Change Interventions Reaching Men with Prostate Cancer**

## Statement of Authorship

### Statement of Authorship- Chapter 2

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Name of Principal Author (Candidate)	Amy Finlay		
Contribution to the Paper	Conceptualization, methodology, data curation, data, extraction, formal analysis, visualisation, project administration, writing-original draft preparation, publication application.		
Overall percentage (%)	60%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	9 7 19

## Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- the candidate's stated contribution to the publication is accurate (as detailed above);
- permission is granted for the candidate to include the publication in the thesis; and
- the sum of all co-author contributions is equal to 100% less the candidate's stated contribution

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Contribution to the Paper	30% Conceptualization, blind viewing of the articles, funding acquisition, data curation, validation, methodology, visualization, manuscript reviewing/ editing, and supervision.		
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## Abstract

**Purpose:** Men who are survivors of prostate cancer report a variety of psychological and physical factors contributing to a lower quality of life and physical activity can assist to mitigate these issues. This review aims to provide a summary of physical activity behaviour change trials targeting prostate cancer survivors, assess the feasibility of these interventions, and if possible to identify intervention and study characteristics associated with significant intervention effects.

**Method:** Four databases (PubMed, CINAHL, PsycINFO, and EMBASE) were systematically searched for randomised controlled trials containing at least one behavioural outcome relating to physical activity published up until July 2016. Forward and backwards, hand, key author citation searching, and known research were also considered.

**Results:** From a total of 13, 828 titles, the search resulted in 12 studies (6 prostate cancer only and 6 mixed cancer interventions) eight of which found positive results most often related immediately post-intervention aerobic activity. Factors relating to efficacy were not conclusive due to the heterogeneity of studies and lack of cancer specific data in mixed cancer trials. Future research focusing on intervention reach, maintenance of intervention effects, and resistance-training outcomes is needed.

**Conclusion:** There is preliminary evidence to suggest that a variety of physical activity behaviour change interventions targeting men with a history of prostate cancer can be efficacious, at least in the short-term. Experimental studies are required to identify key intervention features.

**Implications for cancer survivors:** Physical activity interventions can assist prostate cancer survivors in relation to short term lifestyle change, though more evidence is required to improve the clarity of factors related to efficacy.



# A Systematic Review of Physical Activity Based Behaviour Change Interventions Reaching Men with Prostate Cancer

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## Introduction

Prostate cancer is the most common cancer diagnosed in men within developed nations [1] and has a high associated economic burden [2]. Advancements in detection and treatment of prostate cancer have led to improved 5-year survival rates, which are now over 90% in many countries [3, 4]. While this increase in survivorship is welcomed, the associated psychological and physiological issues must also be acknowledged [5, 6]. The prevalence of anxiety and depression among men pre, during and post-treatment is relatively high compared to population norms [7]. At each of these time points, at least 15% of men can be expected to experience anxiety or depression [7], with higher rates observed pre and post-treatment, and among men with advanced disease [8]. Physical functioning of survivors is also adversely impacted by prostate cancer treatments (i.e., surgery, radiotherapy and hormone treatment). Common side effects include incontinence (reported by between 25-70% of men [9, 10]), and erectile dysfunction (impotent after treatment reported at approximately 65.5% [11]), as a result of pelvic injury from radical prostatectomy and radiotherapy treatments [9, 10]. Further sequelae include cancer related fatigue due to radiotherapy [12] and/or hormone treatments including Androgen Deprivation Therapy (ADT) [13] used for advanced and metastatic disease [14]. Those on ADT also experience poor metabolic functioning, reduced bone and muscle integrity [15], hot flushes, sexual dysfunction, low mood and poor motivation [16, 17].

Previous literature has demonstrated that adequate participation in physical activity can address many of these issues, regardless of disease and treatment phase. This includes improvements in reported quality of life, bone mass and bone loading, and reduced fatigue [18, 19]. Furthermore, there is growing evidence from prospective studies to indicate that regular physical activity may prevent disease progression [20], as well as decreased all cause and prostate cancer specific mortality among men diagnosed with localised disease [21]. Based on this evidence, regular physical activity participation is recommended throughout the cancer journey [22]. Specifically, oncological guidelines focus on avoiding inactivity, and working towards 150 minutes of moderate to vigorous physical activity, and two resistance-training sessions per week [23]. However, most men with a history of prostate cancer are insufficiently active to obtain therapeutic benefits [24, 25]. Common barriers include age and additional

comorbidities [26, 27], pain, time constraints [26, 28], low mood and motivation [27] (particularly affected by those on ADT [26]). Given these unique challenges, prostate cancer specific interventions are recommended to facilitate the adoption and maintenance of physical activity among men with prostate cancer. However, little is known about what intervention options are likely to be feasible to deliver and efficacious. This is in part owing to a lack of research synthesis in this area. While several comprehensive reviews focused on the efficacy of behaviour change interventions among cancer survivors have been conducted, these have predominantly focused on breast cancer survivors and/or have not synthesised prostate cancer specific literature [29-33]. To inform future research in this area, the current review aimed to provide a comprehensive synthesis of physical activity behaviour change trials targeting prostate cancer survivors, assess the feasibility and efficacy, and, if possible, to identify intervention and study characteristics associated with significant intervention effects.

## Method

### *Search Strategy*

This systematic review utilised the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)[34]. PubMed, CINAHL, PSYCINFO, and EMBASE were systematically searched to identify articles, with no lower bound, and an upper bound of publications until mid-July 2016. The search strategy was generated in collaboration with a university librarian. The strategy used Boolean logic to ascertain relevant articles. Search terms included “prostate” AND “cancer OR neoplasm” AND “exerci\* OR physical activit\* OR motor activity OR movement OR circuit training OR muscle stretch OR resistance OR aerobic OR running OR jogging OR walking OR swimming OR sport\* OR yoga OR exercise movement techniques OR step count OR accelerometer OR Godin Leisure Time OR behav\* change OR community based OR health promotion OR lifestyle change OR quality of life” AND “randomised controlled trial OR intervention OR trial OR program OR pilot.” Articles known to researchers and articles searched for by hand were also considered. Backward and forward searching of relevant systematic reviews and articles identified from the database were also undertaken.

### *Inclusion and Exclusion Criteria*

Studies were included if they: a) were randomised control trials with physical activity behaviour change outcomes (such as step count, minutes of exercise per week etc.) as primary or secondary outcome; b) include adult (18+) men with a history of prostate cancer; and c) evaluate a behaviour change intervention designed to increase physical activity (including trials focusing on multiple behaviours). Mixed cancer studies must have reported the proportion of prostate cancer or total number of participants with a history of prostate cancer in order to be included. Studies were excluded if; a) they included participants with a history of prostate cancer but did not provide a sample size or proportion, b) allocation to study condition was not described as random, c) the evaluation involved pre and post-test measures only with no appropriate control or comparison group, d) study details were reported in abstracts, editorial papers or protocol only papers with no full text paper published and/or e) they were published in a language other than English.

### *Data Extraction*

A data abstraction form was trialled and amended by AF and CS. The following data were extracted: *sample characteristics* (sample size, proportion of prostate cancer participants, cancer type, mean age, patient inclusion criteria, treatment type and stage of cancer (note that participants on ADT were assumed to have advancing disease [14] unless otherwise specified); *methods* (recruitment source, sampling strategy, recruitment rate, number of participants in each RCT arm, type of control, controlling for confounders, physical activity outcome measures, data analysis and follow up (short term <3 months, mid-term 3-6 months, long-term > 6 months); *intervention design* (targeted behaviours, setting, exercise supervision or no supervision delivery format, intervention length, behaviour change theories, and behaviour change techniques (inferred from descriptions of the intervention). Descriptions were reported in line with the CALO-RE taxonomy of behaviour change techniques [35]. Outcome related data was also extracted including the flow of participants through the trial and intervention effects on physical activity outcomes immediately post intervention, and follow up. A

single reviewer (AF) assessed all titles, abstracts, and full text articles for eligibility and extracted relevant data.

### *Risk of Bias*

Risk of bias was assessed using the McMaster Bias Tool [36, 37]. This tool assesses eight components of methodological quality (selection bias, study design, confounders, blinding, data collection methods, withdrawals and drop-outs, intervention integrity, and analysis) of which six components generate a global rating of “strong”, “moderate” or “weak”. The McMaster Bias Tool provides cut off scores on the data extraction document that dictates the global rating scores. If a study has no weak scores within the six domains, it received a global rating of “strong”. If a study contained one weak rating they are considered of “moderate” quality. Studies with more than one weak rating and the study received a “weak” global rating. Both authors extracted the data according to the extraction tool and the associated scoring dictionary [36]. Minor adjustments to the scoring of the confounder and blinding components were made based on current best practice recommendations and practical considerations [38, 39].

Specifically, the risk of bias for confounding was based on whether likely confounding factors had been adjusted or accounted for in randomisation methodology or during data analysis, regardless of differences in participant characteristics at baseline [40]. As blinding is difficult in behaviour change interventions, studies were given a ‘moderate’ rating by default [33]. Additionally, bias relating to withdrawal and dropout was assessed based on the immediate post-intervention follow-up for all studies rather than the final data collection point. This was to ensure that studies containing both immediate and long-term follow-up measures were not systematically rated as more biased compared to studies only reporting immediate post-intervention outcomes. Two authors (AF and CS) conducted independent assessments and discrepancies were resolved by consensus.

## Results

### *Study Selection*

A total of 13, 828 titles were generated from the data base search (see PRISMA flow chart in Figure 1). Additionally, 14 relevant titles were added to the total from backwards and forwards searching, resulting in 11, 451 titles, after duplication removal. A total of 146 abstracts, and 56 full text articles were read and assessed for eligibility. There were 12 studies (described in 27 publications [41-67]) that met the inclusion criteria. For clarity, the main outcomes paper will be referred to for the remainder of this review. There were six studies focusing on prostate cancer survivors only. Half were three arm trials (*Active for Life* [41], *Wii-Fit* [47], and *PROMOTE* [46]); and half were two-armed trials (*ENGAGE* [44], a 16-week intervention (trial not named) [43], and *Exercising Together* [48]). There were six mixed cancer studies, all employing two-armed RCT designs. These were *Fresh Start* [53], *LEAD* [58], *RENEW* [60], *UCAN* [51], *FOCARE* [63] and *ENRICH* [65].

### *Risk of Bias*

The overall methodological quality was considered to be moderate (see Table 1). Of the 12 studies, one study received a ‘strong’ global rating score [41], ten received a moderate rating [43, 44, 46-48, 51, 53, 58, 60, 65] and one study received a weak rating [63]. Both prostate cancer and mixed cancer interventions had comparable methodological quality. Many studies were of strong methodical rigour in terms of design, though received a moderate rating due to potential selection bias. Recruitment rates were unable to often be calculated due to the methodology (e.g. recruitment through flyers, therefore non responder rates unknown) or the information was unclear [43, 47, 51, 65] (see Table 2). Of those studies who reported recruitment rates, this ranged between 22.1% and 63.7% for prostate cancer studies, and 10.7% and 52.5% for mixed cancer studies (see Table 2). Confounders were also considered moderate, as all studies controlled for baseline physical activity, though 10 of the 12 studies adjusted for additional variables (see Table 3 and Table 4). While strong recruitment methods were often utilised, such as registries or hospital clinics, response rates were typically low

across studies. The one study identified as having a weak methodology [63], was rated as such due to possible selection bias and measurement bias.

### *Participants*

There were 1,161 men with a history of prostate cancer included in the 12 studies (see Table 2). Most participants had completed surgery, and were in the early stages of disease (see Table 2). Trial sample size in the prostate cancer studies ranged from 19 [47] to 423 participants [46] (mean  $n = 165$ ). Mixed cancer studies had larger sample sizes ranging from 95 participants [51] to 641 participants [60] (mean  $n = 357$ ). The average proportion of prostate cancer survivors in mixed cancer studies was 30.4%, ranging from 10.5% [65] to 43.6%.

### *Inclusion Criteria*

Inclusion criteria varied across all studies (see Table 2). Time since diagnosis was used as inclusion criteria in the majority of mixed cancer studies. Three mixed cancer studies required persons less than two years since diagnosis, [53, 58, 63], and one mixed cancer study required those over five years since diagnosis [60]. Half of the prostate cancer studies required men on ADT [41, 43, 47]. One mixed cancer study [65], and three prostate cancer studies [44, 46, 48] required participants who had completed active treatment. Six of the 12 studies required participants who were not meeting physical activity guidelines (three mixed cancer studies [53, 58, 60] and three prostate cancer studies [41, 47, 48]).

### *Outcome Measures*

Two prostate cancer only studies used objective measures as part of their outcome measures [44, 47]. One used pedometer based step counts as the primary outcome [47]; and the other collected both accelerometer and self-report data [44]. One mixed cancer study also assessed behaviour change using pedometer step counts [65].

Four prostate cancer studies [41, 43, 46, 48], four mixed cancer studies [51, 53, 58, 60] used validated self-report measures. One mixed cancer study used a purpose-built measure [63].

### *Follow Up Time Points*

All studies reported immediate post intervention measures. Of the six prostate cancer only studies, three reported additional follow-up post-intervention [41, 46, 47]. One reported a short-term follow-up (<3 months post intervention) [47], one reported a mid-term follow-up (3-6 months post intervention) [46] and one reported long-term follow-up (> 6 months post-intervention) [41]. Five of the six mixed cancer studies included a post-intervention follow up. Two studies collected mid-term follow-up data [63, 65] and three reported long-term follow-up measures [53, 58, 60].

### *Study Retention*

Prostate cancer only studies had an average retention rate of 83% at immediate post-intervention follow-up, ranging between 78% [41] and 100% [47, 48]. Mixed cancer studies had higher retention on average (88%) at the immediate follow-up, ranging from 74% [63] to 93% [53]. This was also observed for retention post follow-up with mixed cancer studies averaging 82% compared to 69% for prostate cancer only studies.

### *Intervention Characteristics*

#### Intervention Setting

Several of the studies included supervised physical activity programs delivered by fitness instructors or exercise physiologists in a gym or clinic setting. This was particularly the case for prostate cancer only studies, with four out of the six prostate cancer only studies delivered in this way [41, 43, 44, 48]. In the remaining studies, one



used minimal supervision to set up a home program [47] and the other contained two intervention arms, both of which were print intervention based at home, though one contained some telephone support [46]. Conversely, supervision was used in two mixed cancer studies [63, 65], with remaining studies unsupervised and primarily based at home [53, 58, 60] or delivered online [51].

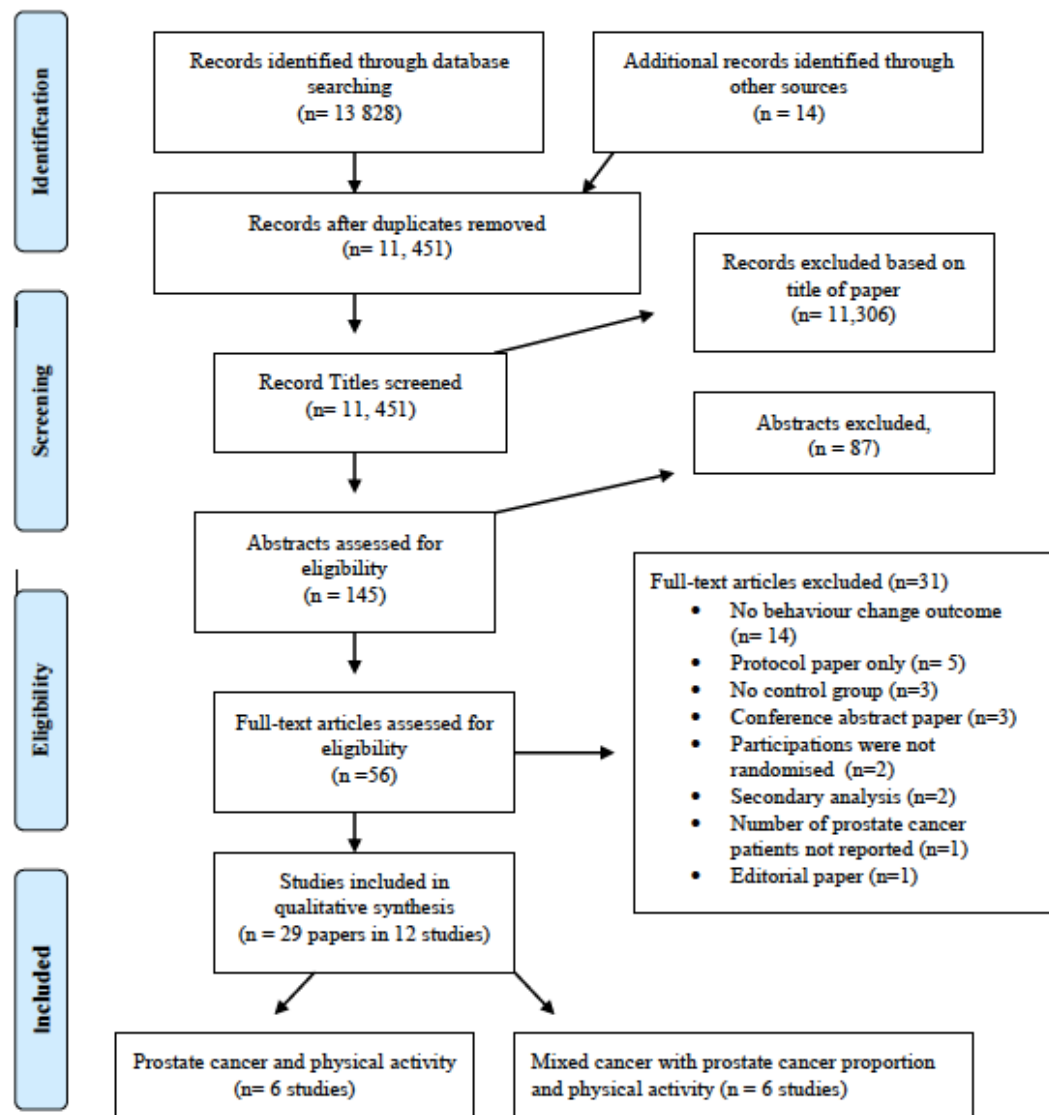


Figure 1: Prisma Flowchart

### Intervention Behavioural Focus

Five prostate cancer studies promoted physical activity (aerobic and/or resistance-based) only. Of those, four studies concentrated on both aerobic and resistance training components [43, 44, 47, 48], and one study focused on aerobic activity only [46]. The remaining prostate cancer study targeted on multiple health behaviours, including aerobic activity and diet [41]. Multiple behaviour interventions were employed in five out of the six mixed cancer studies [53, 58, 60, 63, 65]. Of these, two focused on aerobic activity and diet [53, 58], two studies promoted aerobic activity, resistance training and diet [60, 65], and one study concentrated on aerobic activity, diet and smoking [63]. The remaining mixed cancer study focused on improving physical activity only, including both aerobic and resistance training [51].

### Intervention Length

Prostate cancer only interventions averaged 14 weeks, ranging from 5 weeks [46] to 6 months [41, 48]. Mixed cancer interventions averaged 22 weeks, ranging from approximately one week [63] to one year [60].

### Intervention and Theory

Eight studies incorporated theory, including three prostate cancer studies [41, 44, 46] and five mixed cancer studies [51, 53, 58, 60, 65]. Single theories were used in two of the three theory-based prostate cancer studies [44, 46]. These were based on Social Cognitive Theory (SCT) [68] and the Theory of Planned Behaviour (TPB) [69]. The remaining prostate cancer study [41] was grounded in multiple theories, which included SCT and the Transtheoretical Model (TTM) [70]. The five theory-based mixed cancer studies were all based on multiple theories. In particular, three were based on SCT and TTM [53, 58, 60], one [51], was guided by SCT, TBP and the Socio-Ecological Model [71] and the remaining [65] drew from SCT and the Chronic Disease Self Management Framework [72].

## Behaviour Change Techniques

The majority of studies used a combination of behaviour change techniques (see Table 3 and Table 4). The most commonly used techniques were goal setting [41, 43, 44, 46-48, 51, 53, 58, 60, 65], encouragement to self-monitor [41, 43, 44, 46, 47, 51, 53, 58, 60, 65], provision of information about the consequences of the behaviour [41, 43, 44, 46-48, 51, 53, 58, 60, 65], and barrier identification [41, 43, 46, 51, 53, 58, 60, 65]. These techniques were used in the majority of prostate cancer only and mixed cancer studies. Supervised programs were likely to facilitate social support through opportunities for social group interactions and were more commonly used in prostate cancer only studies [41, 43, 44, 48] compared to mixed cancer studies [63, 65]. Likewise, demonstrations of behaviour were likely to have been more common in these programs.

## *Intervention Efficacy*

### Immediate Post-Intervention Effects

Significant intervention effects on physical activity were reported in five prostate cancer studies [43, 44, 46-48] and three mixed cancer studies [53, 60, 65], with 43.6%, 39.5% and 10.7% proportions of prostate cancer participants respectively, at the immediate post-intervention time point. Objective measures were used in two of the prostate cancer studies [44, 47]. In one of these studies, a home-based walking and resistance intervention lasting five weeks was found to significantly increase steps (mean increase = 2720; 95% CI = 1313, 4128), compared to usual care (mean decreased = -383.4 steps, 95% CI: -1140, 1333) and compared to the second intervention arm that used a Wiifit (mean increase = 382 steps; 95% CI: - 473, 1238;  $p = 0.71$ ). In the other objective outcomes study, a clinician referral and exercise program spanning 12 weeks was not found to increase moderate-vigorous physical activity assessed via accelerometers (secondary outcome) or self-report (primary outcome) compared to the usual care, however significant intervention effects on self-reported vigorous physical activity (mean difference = 45 minutes, 95% CI = 0.09; 0.82) and the proportion of participants meeting aerobic guidelines were observed (secondary outcomes) [44].

Of the remaining prostate cancer only studies reporting significant effects [43, 46, 48]; one demonstrated the efficacy of a 6 month couples-based supervised program compared to usual care [48]; another showed significant effects of one home-based interventions (print-based implementation) compared to print-based plus telephone assistance intervention and a standardised physical activity recommendation control [46]; and one demonstrated the effects of a 16 week mixed modal program (home based with minimal supervised) focusing on aerobic and resistance-based physical activity compared to a Wii fit intervention and wait-list control [43]. The magnitude of effects in each of these studies was reasonable and may have clinical relevance (Table 3 and Table 4). Of note, the smallest effect was observed in the 16 week mixed modal program targeting men on ADT, with participants in the intervention group increasing physical activity by 19 minutes per week, and those in the wait-list control group decreasing activity by 5 minutes per week ( $p = 0.004$ ). The impact of the four interventions targeting resistance training [43, 44, 47, 48] is unknown, as resistance-training behaviour was not assessed as a behavioural outcome in these studies.

Three mixed-cancer home based interventions also reported significant gains in physical activity [53, 60] at the immediate post-intervention time point. One study that provided behaviour change support via tailored newsletters and telephone counselling for 10 months produced small but significant effects in the number of goal behaviours changed in accordance with guidelines (primary outcome) and in self-reported aerobic activity (112.7min per week vs. 83.8min per week,  $p=0.02$ ; secondary outcome) compared to a minimal intervention control [53]. This program was targeted at recently diagnosed breast (56.3%) and prostate cancer (43.6%) survivors and aimed to improve both diet and physical activity behaviours.- The other study was similar but was of longer duration (12 months) and focused on long term ( $\geq$  five years post diagnosis) survivors of breast (~45%), prostate (~40%), and colorectal (~15%) cancer who were overweight or obese [60]. Compared to those allocated to the wait-list control, participants allocated to the intervention condition reported participating in an additional 32 minutes of moderate-vigorous aerobic on average at the first post intervention time point.

The final mixed cancer study contained significant changes in step counts but contained a low proportion of prostate cancer survivors (10.5%) [65]. The remaining

three mixed cancer studies reported non-significant results [51, 58, 63], (see Table 4). No single mixed cancer study examined the moderating effect of cancer type on study outcomes, and thus the intervention effect specifically for prostate cancer survivors in these studies is unknown.

### Maintenance of Effects at Follow Up

Three prostate cancer studies [41, 46, 47] and five mixed cancer studies collected follow up data [53, 58, 60, 63, 65]. Two studies were unable to maintain physical activity effects at follow up [41, 46], and one study maintained intervention effects in the short term (<3 months) [47] (see Table 3). Mid-term (3-6 months) effects were reported in two mixed cancer interventions [53, 60]. Of the two mixed cancer studies assessing long-term follow-up (>6 months) data with 43.6% and 39.5% proportions of prostate cancer [53, 60], only one reported that effects were maintained at this time-point [60]. These two studies involved intervention programs that were delivered over 10-12 months [53, 60].

### Factors Associated with Efficacy

The ability to identify and evaluate key factors linked to efficacy was limited due to heterogeneity between studies. Overall, five prostate cancer studies were considered efficacious (see Table 3) including two supervised programs [43, 48], one mixed modal intervention [44] and two home based interventions [46, 47]. Of the three 3-armed prostate cancer only RCT designs [41, 46, 47], two studies contained tailored print based interventions demonstrated superior effects compared to the control [46, 47]. One tailored home program was superior compared to both the control and Wii fit program [47], while there was no significant difference between the *PROMOTE* program and the *PROMOTE + telephone* arm [46]. One home based mixed cancer study with 43.6% prostate cancer participants also reported positive changes [53]. This indicates that distance based studies may be a promising delivery method and may provide an alternative to face-to-face programs.

## Discussion

The primary aim of this review was to examine the feasibility and efficacy of physical activity behaviour change interventions targeting men with prostate cancer and identify intervention study characteristics associated with significant intervention effects. Prostate cancer only interventions were able to show some promise for moderate gains in aerobic physical activity at least in the short to mid-term. The same pattern was seen in the mixed cancer studies for the whole sample, but the efficacy of these interventions for prostate cancer patients specifically is unknown. Factors associated with intervention efficacy are also unclear, owing to the heterogeneity of studies. These findings are similar to previous reviews focusing on other cancer types [30, 33], and support the conclusion that behaviour change among cancer survivors may be possible using a variety of strategies and intervention modes. However, if such programs are to have a real world effect greater consideration of their reach, sustainability to deliver and maintenance of effects on aerobic and strength training outcomes is needed.

### *Feasibility and Intervention Reach*

The heterogeneous nature of these studies indicates that many forms of intervention delivery are feasible to deliver to men with prostate cancer. Two prostate cancer studies were considered to have the capacity to be implemented on a large scale with substantial population reach (such as print, home, or online programs) [46, 47]. In contrast, many-mixed cancer interventions were distanced based [51, 53, 58, 60]. This highlights the feasibility of distance-based interventions, as prostate cancer patients did appear to participate in these studies to various extents, as participation was generally high (average 30%). The reasons for the focus on supervised programs in prostate cancer only studies remains unclear, though it may be related to prostate cancer behaviour change studies often including participants with more advanced disease, or that behaviour change interventions relating to prostate cancer are relatively recent compared to breast cancer [29, 33]. While face-to-face programs are often considered the gold standard in terms of safety and the extent of tailored support that can be provided [73], from a public health perspective there is also the need to have high

quality non-supervised programs available. These are needed to provide an alternative programming option to men who may face barriers that inhibit participation in supervised programs, such as geographical isolation and cost [74, 75], or potentially embarrassing incontinence in public [6]. They may also represent a more cost-effective model of providing behaviour change support to older populations [76], especially among men with fewer contraindications to exercise.

Distance based interventions in this field are considered highly relevant for cancer due to their feasibility and reduced resource usage [77] and can be efficacious at delivering behaviour change [78, 79]. Interventions targeting other topic areas (e.g., sexuality or treatment decision support), suggest that such non face-to-face approaches are acceptable to men with prostate cancer [80, 81], and therefore should be explored in relation to physical activity and lifestyle support. Therefore, more research focusing on distance-based interventions specifically for prostate cancer survivors is encouraged.

### *Engaging More Men*

Selection bias and recruitment was a major issue across studies included in this review and is generally recognised as a major challenge in men's health research [82, 83]. Overall, there is little previous research investigating how to improve recruitment rates of men, and indeed men's uptake of health services [84]. This would involve designing recruitment strategies and health services specifically with men in mind to improve use and engagement in services (rather than using a service to address a male specific disease [84]). Some recent trials of face-to-face behaviour change interventions targeting men provide a good example of this (e.g.[85, 86]), though it has remained challenging in distance-based interventions [87]. In terms of recruitment, there is some evidence that using celebratory appeal (e.g., sports star, politician) [84], or recruitment through partners or community groups (e.g. Rotary) may assist to increase male participation in health programs [88]. Within the studies included in this review, cancer registry [46, 53, 58, 60], hospital/ clinics [41] or use of practitioners [44] appeared to be more successful recruitment strategies.

### *Treatment and Stage of Disease as Modifiers*

Due to the heterogeneous nature of the data, we are unable to define any clear differences between the three ADT only studies and the other prostate cancer or mixed cancer studies. However, it is worth noting that due to the lack of experimental data regarding comparing and contrasting different disease states, it is hard to determine if treatments are acting as potential modifiers. For example, a qualitative exploration compared barriers of exercise among men on ADT to men not on ADT [26]. Keogh et al (2014) found age and multiple morbidities were perceived barriers in both groups, however, non-ADT men reported time constraints as a main barrier, whereas the ADT group found increased fatigue and low motivation as their primary difficulties to engaging in physical activity [26]. These treatment based differences could be taken into account when designing interventions, especially given that interventions that are more relevant and/or tailored to participant characteristics have consistently been found to be more relevant [57]. These differences should also be taken into consideration during data analysis. It is possible or even likely that they moderate intervention effects. This was not explored in the included studies. Doing so would improve our understanding of what interventions work better for whom.

### *Recognising Resistance Training*

Resistance training is recommended in the oncological guidelines [23] and is able to improve bone muscle loading, endurance and assist to decrease the risk of falls. This is of particular importance for those men on ADT, which can result in muscle loss [89]. It was noted that many interventions did not include resistance training or measure behavioural outcomes for resistance training as a part of their physical activity program. Many of the prostate cancer studies in this review contained information related to resistance training [43, 44, 47, 48], however reporting resistance training behavioural outcomes in minutes or frequency was present in only two mixed cancer studies [51, 65]. The reason for this is unknown, though many previously resistance training trials use outcome based information (such as standardised tests [89, 90]) and lack behavioural measures. Future trials should consider incorporating resistant training into



their interventions, given the exercise oncology guidelines and incorporate procedures to measure these outcomes.

### *Limitations*

It is important to note that caution should be taken in regard to the results and conclusions drawn from mixed cancer studies when applying this to prostate cancer populations. Though two home based significant interventions did contain almost ~40% prostate cancer participants [53, 60], cancer-specific data was not reported in any study in terms of retention rates or behaviour change outcomes. This limits any definitive and specific conclusions for these studies, though it can indicate feasibility to reach men with prostate cancer. This is an important limitation to highlight, as many behaviour change interventions combine mixed cancer groups and the efficacy for each cancer group is not known. Our review was specifically broad to allow the capture of the most prostate cancer participants as possible within our inclusion criteria. Future studies should report sex and disease specific data to allow comparison between groups to ensure that outcome masking is avoided. To ensure that more conclusive findings can be obtained, future reviews should specify proportion of representation for prostate cancer patients within a mixed sample is considered representative.

While this review is the first to synthesise literature regarding RCTs of behaviour change related to physical activity and prostate cancer, there are some limitations of the literature reviewed that need to be noted. Trials that collected but did not publish behaviour change measures in the study [90], were excluded and authors were not pursued to release unpublished data. Studies that contained men with a history of prostate cancer but did not publish the key proportions of prostate cancer patients within their sample could also have resulted in exclusion of potentially efficacious interventions, and only studies published in English were included. There were several studies compared multiple interventions however the ability to compare these to establish factors relating to efficacy were limited. Outcome measures also contained a heavy reliance on self-report measures, thus limiting the objectivity of outcome variables, echoing findings noted in the literature [32, 91, 92].

## Conclusion

This systematic review synthesised the efficacy of behaviour change interventions targeting men with a history of prostate cancer to improve their physical activity. There is preliminary evidence to suggest that interventions that specifically target men with prostate cancer, or include a sample of men with prostate cancer, can generate moderate behaviour change in the short to mid-term. Where assessed, long-term outcomes are mixed and require further investigation. Factors associated with efficacy were unable to be identified due to the heterogeneity of included studies. Further, a lack of cancer specific data in mixed cancer studies resulted in limited generalisations to men with prostate cancer. However, it does seem that behaviour change can occur using a variety of intervention delivery modes. Future research focusing on more wide-reaching interventions, interventions designed specifically to appeal to men at different stages of disease, and interventions that incorporate resistance-training and assess outcomes using objective measures are encouraged. Finally, as the field matures, more attention as to what interventions work for whom is needed.

Table: 1 Risk of Bias

Prostate cancer only studies							
First Author	Selection Bias	Study Design	Con-founders	Blinding	Method	Dropout	Global Rating
Carmack-Taylor et al 2004 (41)	Moderate	Strong	Strong	Moderate	Strong	Strong	Strong
Culos- Reed 2009 (43)	Weak	Strong	Moderate	Moderate	Strong	Moderate	Moderate
Livingstone, 2011 (44)	Weak	Strong	Moderate	Moderate	Strong	Strong	Moderate
McGowan, 2013 (46)	Weak	Strong	Strong	Moderate	Strong	Moderate	Moderate
Sajid 2016 (47)	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Winterstone 2012 (48)	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Mixed Cancer with % of Prostate Cancer							
% of Prostate cancer in sample							
Forbes 2014 (50), 52%	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Demnark-Wahnefied et al, Fresh Start, (53) 42%	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Denmark-Wahnefied 2004, 2006 LEAD (58), 34%	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Ibefeit 2011; (63), 17%	Weak	Strong	Strong	Moderate	Weak	Moderate	Weak
Denmark-Wahnefied 2012, et al-RENEW (60), 15%	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
James 2011, (65), 10%	Weak	Strong	Strong	Moderate	Strong	Moderate	Moderate

Table 2: Overview of RCT trials included in review regarding physical activity for prostate cancer only

First Author, Year	Recruitment	Participants (n) Mean age in years	RCT Arms (n) Accounting for confounders	Targeted outcomes Setting	Length Follow up post intervention	Theory Primary behaviour change techniques	Mode and intensity of intervention	Behaviour Change Measure for PA Data analysis	Retention % at Post intervention (1) and at follow up (2)	Results
<b>Carmack Taylor 2004, (55); Carmack Taylor 2006</b>	Hospital, medical intuitions medical practitioners and community advertising	Participants: n=134 Mean age: 65.2 <i>Inclusion:</i> confirmed adenocarcinoma of the prostate (any state), under continuous ADT with at least 1 year expectation to continue, within 1 hour or Cancer	3 arms  Lifestyle program (LP) n=46; Education Program (active control) (EP), n=44; UC (n=34) Adjustments for emotional wellbeing,	Aerobic and diet.  Setting: Supervised. Clinic and home-based	6 months  Follow up: 6 months	SCT, TTM, and CBT  Information on behaviour (general, individual), goal setting (behavioural, individual), action planning, barrier identification, self-monitoring (behavioural), relapse prevention, time management, and stress management, social support.	Intervention and attention control participants attended 16 weekly sessions followed by 4 bi-weekly 1.5-hour meetings in groups of 8 men, and facilitator. Lifestyle group had instructions to track diet and exercise. Educational intervention covered general cancer topics and were encouraged to exercise from home. Usual care sent education print material on guidelines and	7-Day Physical Activity Recall.  Complete case. linear regression.	LP Post intervention 78%, Follow up 76% EP Post intervention 78% Follow up 78%	Non-significant increase differences between all groups in mean days exercised per week, increased in days per week for total length at post intervention or follow-up. Intervention increased from 1.8 days to 3.5 days (post intervention) to 2.3 days at
<b>Active for Life USA</b>	63% (632/992)									

		centre. Excluded if meeting PA at 30min at 3 times per week over 6 months.	physical functioning, vitality, BMI, time on ADT and use of psycho-tropic medication age and ethnicity				community resources.		UC Post intervention 83% Follow up 91%	follow up. AC 2.9 to 3.5 at (post intervention) and 2.3 days at follow up. UC from 2.3 to 2.8 post intervention to 3.4 (follow up)
<b>Culos- Reed 2009</b>	Recruitment strategy not adequately described. Re-sponse rate not adequately described	Participants: n=100  <i>Mean age:</i> 67.7 years  Inclusion: Prostate cancer survivors, ADT for at least 6 months,	2 arm  Intervention (n=53) and WLC (n=47)  Baseline PA	Aerobic, and resistance training  <i>Setting:</i> Supervised gym and home-based	16 weeks  Follow up: NA	Information on behaviour (general and individual) Goal setting (behavioural) barrier identification, self-monitoring (behavioural), modelling/demonstration of behaviour, instruction on how to and when and where to perform behaviour, social discussion, tailored information, social support.	Home-based and weekly group sessions. Tailored individualised program from once off consultation with a fitness instructor in week 1. Walking, stretching and resistance for home-based program (suggested for 5 times per week). Participation in a weekly group session at a fitness centre, 1 hour activity, ½ hour education/ peer support and discussion.	GLTEQ  Intention to treat, ANCOVA	Intervention  Post intervention 79%  WLC  Post intervention 51%	Significant increase of MVPA minutes. Pre to post intervention with 71% increase in MVPA for intervention group 26.36 min to 45.05min, (p=0.004). Controls 35.86 min to 31.14 min per week).  Resistance training behaviour change results not reported.

<b>Livingstone, 2011; Livingstone, 2015;</b>  <b>ENGAGE</b>  <b>Australia</b>	Urology and radiation oncology outpatient clinics in 3 hospitals	Participants: n=147  n=15 clinicians  Mean age:65.8	2 arm  Intervention (n=53)  UC (n=93)	Aerobic, and resistance training	12 weeks  Follow up: anticipated 6 month and 12 months (no data)	SCT  Information on behaviour (general and individual), instruction on how to <i>and</i> when and where to perform behaviour, modelling/demonstration of behaviour, goal setting (behaviour), self-monitoring (behavioural), facilitate social comparison, plan social support/social change	Prescribed 24-gym group based 50-min sessions over 12 weeks. Exercise physiologist supervised 2/3 gym sessions per week for individual training.. Aerobic training for 20 min at 40-70% of predicted heart rate maximum or 8-13 score of exertion on Borg Scale (max 15 score). One set of 8-12 repetitions in 2-4 upper/lower body exercises and 1 core strengthen exercise using therabands-progression to machines and weights. Increasing to two sets or more dependent on individual and use of Thera-band.	GLTEQ, Accelerometer  Intention to treat  Odds ratio and effect size (binary outcomes)  ANOVA (continuous outcomes)	Intervention  Post intervention on 86.7%  UC  Post intervention on 91.2%	Significant differences vigorous exercise (33 minutes compared to control). Significant odds ratio of 3.9 (CI 1.71 -7.8, effects size, d=.75) for intervention group meeting guidelines. Non-significant improvements in both arms PA for MVPA (intervention +84 min, 168 min to 252, control +49 min, 104 min to 153 min). No significant accelerometer data.  Resistance training behaviour change results not reported
	46%  (147/320) prostate cancer patients  71%  (15/21) clinicians	Inclusion:  Completed active treatment for curative intent for 3-12 months prior to study, or on ADT, adequate English, curative intent for stages I II or III.	Baseline physical activity	Supervised gym and home-based			UC from physician (no referral) aiming for PA guidelines.			

										intervention group.
McGowan 2013  PROMOTE USA	Prostate  Cancer Registry	Participants:  n= 423  Mean age: 68.4	3 arms  Telephone Intervention	Aerobic activity	4 weeks	TPB	All participants received fact sheet of PA guidelines. Self- administered intervention arm used SMART goal setting techniques, and action plans of how to achieve the self-set goals. Telephone arm contained goals and action plans plus telephone counselling. Usual care group received fact sheet on PA guidelines (standard physical activity advice).	GLTEQ  Multiple Imputation  ANCOVA	Telephone  Post intervention 73%  Follow up 69%  SA  Post intervention 74%  Follow up 73%  UC:  Post intervention 80%  Follow up 72%	Significant differences between self- administered arm and control (adjusted +82 min of moderate PA, P=0.002. UC +36 min per week, self- administered +117 min). Non-significant differences between telephone arm and UC (adjusted +4 min, p=0.353). No difference in vigorous activity, or at 3- month follow- up.
	31.67%  (475/1500)	Inclusion: >18 years, diagnosed with prostate cancer between 2005- 2009	(n= 141);  Self administer (SA) (n= 141);  UC (n=141)   Adjustments for baseline PA, age, stage of disease, treatment, and disease status.	Setting: Home, unsupervised	Follow up: 3 months	Information on behaviour (general and individual) goal setting (behavioural), action planning, barrier identification, self-monitoring (behavioural), teach to use prompts/cues, use of follow up prompts.				

<b>Sajid 2016</b>	Recruitment strategy not adequately described	Participants: n=19	3 arms	Aerobic and resistance training, balance	5 weeks	Information on the consequences of the behaviour in (general and individual), goal setting (behavioural), set graded tasks, prompt review of behavioural goals, prompt self-monitoring (behaviour) follow up prompts (phone calls) Wii fit: in addition: instruction on how to perform behaviour	Exercise physiologist consultation at beginning of interventions for print based EXCAP and Wii Fit. Weekly phone calls to participants to talk through program. Resistance bands with instruction to increase resistance overtime were used. Set number was to increase over time, meeting at least a 3-5 exercise rating of excursion on the ACSM scale, at least 5 days a week. Encouragement to increase of daily step count to 10,000 steps per day over the 5-week program, and increase their step count from 5%-20% per week.	Step count/Pedometer	Wii Fit	Significant increase in step count for EXCAP of 2720 steps at each follow-up (95% CI: 1313, 4128) compared to the usual-care arm ( $p < 0.01$ ); the usual-care arm had an increase in number of steps by 97 steps (95% CI: -1140, 1333). Those in the Wii-Fit arm reported a non-significant increase of 382 steps at each follow-up (95% CI: -473, 1238; $p = 0.71$ ). Resistance training behaviour change results not reported
<b>Wii Fit and EXCAP</b>	Response rate not adequately described	Mean age: 74.9	Wii Fit (n=8); EXCAP (n=6);		Follow up: 6 weeks			Mixed linear regression models with a maximum likelihood estimation	Post intervention 100%	
<b>USA</b>		Inclusion Cancer	UC						Follow up 62.5%	
		>65 years, ADT for at least 3 months, excluded those who were already adequately active.	(n=5)	Setting: Home based					EXCAP	
			Adjusted modelling	Supervised					Post intervention 100%	
			Adjusted for PSA levels, age, ethnicity education in analysis, time x intervention interaction effect analysis						Follow up 33.3%;	
									UC	
									Post intervention 100%	
									Follow up 60%	



<b>Winter-Stone 2012, Winter-stone 2015,</b>  <b>Exercising Together</b>  <b>USA</b>	Prostate cancer registry, clinic, support groups, patient conferees and internet media	Participants: n=64  Mean age: 71.8  <i>Inclusion:</i> >60 years, received and completed treatment, willing spouse, not meeting resistance training guidelines	2 arm  Intervention (n=32) couples  UC (n=32)  Maximum likelihood model, accounting for covariates age and time since diagnosis,	Aerobic, and resistance training    Setting: Supervised university and home-based	6 months  Follow up: NA	Information on behaviour (general and individual), goal setting (behavioural), instruction on how to perform behaviour, goal setting (behavioural) set graded tasks, prompt review, facilitate social comparison, behavioural goals, set graded tasks, prompt self talk, self monitoring, social support	1-hour resistance training 2x weekly for 6 months. Exercise physiologist supervised and tailored information for each participant (1:16 ratio). Couples took turns being 'coach'. Progressive step training for resistance with 8-10 difference lower and upper body exercises set at X % of body fat, increasing from 1% to 15% of total body fat at a rate of increasing 2-4% per month for first four months. Intensity increasing by 1-2 per month for first 4 months. UC instructed to maintain usual PA activities, then received a home-based video instruction of exercising together.	CHAMPS  Intention to treat  Mean substitution for random missing data.  ANCOVA  Hierarchical linear modelling	Intervention: Post intervention 100%,  UC  Post intervention 84%	Significant increase MVPA for intervention arm compared to UC. Difference of 269 kcal/day (95%CI 116.2 to 490.28 kcal/day, p<0.01). Resistance training behaviour change results not reported, though class  Adherence at 78%.
	Prostate Cancer									
	22%  (64/290)									

\*ADT, androgen deprivation therapy; US usual care; WLC, wait list control; SCT social cognitive theory; CBT cognitive behaviour theory; TTM trans-theoretical model, SEM social ecological model; PST problem solving theory; CDSMF chronic disease self management framework; PA physical activity, MVPA minutes of moderate to vigorous physical activity, GLTEQ, Godin Leisure-Time Exercise Questionnaire, CHAMPS Community Healthy Activities Models Program for Seniors;

Table 3: Overview of RCT trials included in review regarding physical activity for mixed cancer trials contained prostate cancer

First Author, Year	Cancer Types	Participants (n= prostate/ Whole sample);	RCT Arms (n)	Target ed outcom es	Length Follow up post interve ntion	Theory Behaviour change techniques	Mode and intensity of intervention	Behaviour Change Measure for PA Data analysis	Retentio n %	Results and Follow Up
Trial Name	Response Rate (before eligibility status)	Mean age;	Accounting for confounders	Setting						
Country	Recruitment	Inclusion criteria								
<b>Demark-Wahnefried et 2007,</b>	Breast and Prostate Cancer	Participants n=237/543 (60.2%)	2 arms	Aerobic activity and diet	10 months	SCT TTM	Tailored print and workbook, newsletters sent every 7-9 weeks for 10 months describing information, goal setting and barrier identification. Attention control received personalised workbook and general information about diet and exercise.	7day PA recall (min per week), % of participants reaching 2/3 behavioral goals	Intervention Post intervention: 93.4%; Follow up: 86%	Significant difference in MVPA between intervention vs. control at 2 months post intervention, (p=0.02). Non-significant at 1 year follow up (p=0.70)
<b>Fresh Start USA</b>	42% (752/1751) Cancer registry	Mean age: 57 <i>Inclusion:</i> early state prostate or breast cancer within 9 months of diagnosis, did not have medical conditions which may inhibit participation in PA, including only those not meeting 150 min per week.	Intervention (n=271); Attention Control (n=272) Block randomisation stratified for gender, number of behaviour, ethnicity, baseline PA, baseline fruit and vegetable consumption; covariates during analysis. Baseline variables	Setting: Home based, unsupervised	Follow up: 12 months	Information on behaviour in (general and individual), goal setting (behavioural), action planning, barrier identification, self-monitoring goals, prompt rewards on contingent effort towards behaviour, provide feedback on performance		Intention to treat, logistical regression model controlling for baseline value of outcomes.	Attention Control Post intervention: 98% Follow up: 93%	Control average +40.9 min/week baseline to 2 months post intervention (42.9min to 83.8 min/week increasing to follow up 103min/week at follow up). Intervention

adjusted.										average +59.3 min/week at 2 month intervention follow up (53.4 min/wk to 112.7 min/wk to 113.1min/wk at follow up. Cancer-specific data not available
<b>Demark-Wahnefried 2004, 2006</b>	Breast and Prostate Cancer	Participants: 78/182 (42.8%)	2 arms	Diet and aerobic activity	6 months	TTM, SCT	Tailored print workbook and bimonthly phone calls on diet (1-3 months) and PA (3-6 months). Attention control received workbook with phone calls relating to other health topics unrelated to diet and PA (such as flu shots, clinical trials, preventing falls, hearing and vision).	CHAMPS	Intervention	Non-significant change in baseline to 6-months.
<b>LEAD</b>	34%	Mean age: 71.7	Intervention n=76) Attention Control 76		Follow up: 6 months	Information on behaviour in (general and individual), goal setting (behavioural), self-monitoring (behavioural), follow up prompts		Complete case	Post intervention: 92%;	Intervention (+111k/cal per week) to control (-400 k/cal per week, p = 0.22 at 6 months, P=.94 at 12 month follow up.
<b>USA</b>	(688/2037)	Inclusion: >65 years, <18 months of diagnosis, physician approved, not-meeting diet and PA guidelines.	Block randomisation stratified for gender, ethnicity, and contemplation of stage of behaviour change.	Setting: Home based, unsupervised				Random Coefficients Model, Hierarchical Linear Model and Mixed Model ANOVA	Follow up: 86.5%;	Significant changes in self-efficacy of perceived ability to exercise for 3 times per week for at least 30 mins. Cancer-specific data not
	Cancer Registry		Adjusted for mediators of						Control	
									Post intervention: 92.5%;	
									Follow up;	

self-efficacy,  
social support,  
comorbidities,  
social  
desirability,

Mixed model  
repeated  
measures

89.2%

available.

<b>Demark-Wahnefried 2012,</b>	Breast, Colon and Prostate Cancer	Participants: 99/ 641 (15%)	2 arms  Intervention (n=319) and WLC (n=322)	Diet, aerobic and resistance	12 months	SCT, TTM  Information on behaviour in (general and individual), goal setting (behavioural and outcome), self-monitoring (behavioural), barrier identification, set graded tasks, prompt review, follow up prompts (phone calls)	Personally tailored workbook  and quarterly newsletters and telephone counseling with automated prompts  (15 sessions and eight prompts over 12 months) Telephone counselling, weekly for first 3 weeks, then 2 semi-weekly calls, to with monthly phone calls of 15-30 min duration. Therabands provided for resistance training and pedometer for	SF-36 physical functioning subscale (MVPA)  Resistance training frequency; % meeting PA guidelines.  Complete case data post intervention (1 year). Intention to treat at follow up, adjusted analysis based on baseline levels.	Intervention  Post intervention: 84.3%  Follow up: 76.1%  WLC  Post intervention: 89.8% Follow up 76%	Significant changes in secondary outcome MVPA difference of 32 min (intervention 101 MVPA min vs control of 69 min, p<0.05). Intervention had average +45 min moderate exercise per week PA (95%CI 26.9 to 64.6min/week) compared to control (p,<0.001) at 1 year follow up. Intervention group had 0% meeting guidelines at
<b>RENEW</b>	10.7%									
<b>USA</b>	(2,156 /20,015)	Mean age: 73 years.	Block randomised by strata- ethnicity, gender, and cancer (for colorectal cancer), Adjusted modelling age, race, baseline value of outcome, cancer type, number of co-morbidities, education, BMI,	Home based, unsupervised.	Follow up: 12 months					
	Cancer registries, self referred by oncologist,	Inclusion: >65yrs  Overweight or obese, no malignancy in previous 5 years, not meeting aerobic and resistance training								

			physical functioning.				step count self-monitoring.			baseline, increasing to 18% at 1 year, and 17% at 2 years (p<0.001). Cancer-specific data not available.
<b>Forbes 2014</b>	Breast, Colon and Prostate Cancer	Participants: 27/95 (28%)	2 arms	Aerobic and resistance training	9 weeks	SCT, TPB, SEM	A tailored online 9-module behaviour change program, based on previous print materials. Education, goal setting, safe exercise for cancer, support network online, video relevant to each module (simulating face-to-face).	GLTS, step count or flights of stairs;	Post intervention: 85.4%;	Non-sig differences in PA behaviour, however results favoured intervention.
<b>Forbes 2015; Jennings, 2016</b>	52% (218/415)	Mean age: 65 <i>Inclusion:</i> >18 years, current resident of Nova Scotia, had previously completed PA survey, previously been diagnosed with breast, colon or prostate cancer, read and speak English, internet access	Intervention, (n=48); UC (n = 47)	Setting: Online, unsupervised	Follow up: NA	Information on behaviour in (general and individual), goal setting (behavioural), self-monitoring (behavioural), barrier identification, social comparison, plan social support/social change, modelling/ demonstration of behaviour		% Meeting guidelines; Resistance frequency per week	Control 91.4%	Intervention group increased +29 min aerobic (intervention vs. control 42 min adjusted difference, p=0.17, effect size of d =0.17).
<b>UCAN Canada</b>	Previously surveyed respondents from a Cancer registry		Adjusted modelling for motivation, attitude, expected benefits and enjoyment from performing a behaviour, descriptive norm, perceived control of performing behaviour, planning, age,					ANCOVA Maximum likelihood model		Resistance training increased by 14 minutes for intervention group (Adjusted +12 min difference between intervention and control,

				sex, marital status, disease stage, treatment types, treatment status .					P=0.04).	Cancer-specific data not available
<b>Ibefelt 2011;</b>	Breast, colon, rectum and prostate cancer	Participations: 90/507 (17.7%)  Mean age: 60.5	2 arm	Aerobic activity , diet, and smoking	6 days	Information on behaviour in general, facilitate social comparison, social support.	6-day retreat for health and behavioural education and intervention. Participants attended various lectures and group discussions facilitated by health professionals for holistic cancer care. Post intervention measure at 3 weeks after retreat	Self-reported total hours of any PA	Intervention	No significant changes in health behaviour at first measure post intervention at one month (3 weeks after the intervention). Trending towards favouring intervention for increase in PA at 6 month follow up (p=0.07). Cancer-specific data not available
<b>FOCARE</b>	Recruitment rate unable to be calculated	<i>Inclusion:</i> >2 years post-diagnosis, completed primary treatment, cleared to participated in PA.	Intervention (n=259);  UC (n=248).		Follow up: 5 months post intervention			Linear regression	Post intervention: 74.5%	
<b>Denmark</b>	Hospital rehab clinic		Block randomisation	Setting: Retreat and home-based				Logistical regression	Follow up	
			Baseline confounders of cancer site, time since diagnosis, gender, age, education level, PA level					Complete case analysis	71.8%. UC	
									Post intervention: 85%	
									Follow up 83.4%	
<b>James 2011, Stacey 2016</b>	Breast, prostate, colon, melanoma, non-Hodgkin's lymphoma, leukaemia,	<i>Participants</i> (with baseline data)  14/133(10.5%)	2 arm  Intervention (n=89)	Aerobic, resistance training and	2 months	SCT and CDSMF  Information on	Four weekly 2-hour day sessions, followed by four 2-hour fortnightly sessions. Co-facilitated sessions	Step count/ Pedometer  Active	Intervention  Post intervention	Significant step count difference between the intervention and control of 2810 steps increased

<b>ENRICH</b>	ovarian and thyroid	WLC (n=85)	diet	behaviour,	by at exercise physiologist.	Australia Survey (Frequency and duration of PA)	on:	at post intervention and
<b>Australia</b>	Mean age: 58.05			Follow up: 3 months	goal setting, self-monitoring, self-efficacy,	Participations received workbook, activities, hand-outs, open pedometer, Gymstick (resistance training tool), referral to community programs at conclusion of intervention.	76%	2782 steps per day at 3 month follow up (p=0.0009). No significant differences for vigorous activity, or resistance activity.
	Recruitment rate unable to be calculated.	<i>Inclusion:</i> diagnosed with cancer, completed or carer of cancer treatment, >18 years, no diet or PA restrictions, fluent in English, medical clearance from physician.	Consent stratified by age and gender	Setting: Supervised gym, home-based	outcome expectancies, barriers and facilitators, and social support.	Sedentary 5 item questionnaire	Follow Up: 61.3%	Resistance activity control 16min to 32min per week, Intervention 14.7min to 55.5min per week, difference 22min, p>0.05. Sex-specific data not available
	Community recruitment, flyers, non-government cancer organisation, referrals from health centres, practitioners		Adjustment for baseline step count, treatment, time since diagnosis, and treatment by time interactions. Mediator analysis for social support, behaviour goal, self-efficacy, expected outcome, impediments for single and multiple mediator analysis.			Intention to Treat	Post intervention: 89.7%	
						Linear mixed models, adjusting for clustering of cancer and carer relationships, interaction between time and intervention	Follow up: 82.8%	

\*ADT, androgen deprivation therapy; US usual care; WLC, wait list control; SCT social cognitive theory; CBT cognitive behaviour theory; TTM trans-theoretical model, SEM social ecological model;; CDSMF chronic disease self management framework; PA physical activity, MVPA minutes of moderate to vigorous physical activity, GLTEQ Godin Leisure-Time Exercise Questionnaire; CHAMPS Community Healthy Activities Models Program for Seniors Questionnaire;

Table 4: Stage and Treatment of Participants

<b>Author</b>	<b>Prostate Cancer Stage of Disease</b>	<b>Treatment Type (Combined RCT arms)</b>
Carmack-Taylor et al 2004 (41)	Stage not reported	ADT expected to last at least 1 year, averaging 32.7 months. Other treatments not reported
Culos- Reed 2009 (43)	Stage not reported	Cancer survivor on ADT for at least 6 month and on any other treatment. Other treatments not reported
Livingstone, 2011 (44)	Stage I 34.15%; Stage II 39.25%; Stage III 19.25%	Surgery only 41.15% Surgery + Radio 22.5%; Surgery, radiotherapy and ADT 5.45%; Radiotherapy only 13.25%; Radiotherapy + ADT 16.35%; Surgery and ADT 1.5%
McGowan, 2013(46)	Stage not reported ; Local disease 58.6%; Local Advanced disease 20.6%; Metastatic 1.9%; Unsure 18.9%	Surgery 48.7%; Radiation 44.9%; Chemotherapy 2.8%; ADT 32.9%; Watching waiting 27.7%; Completed active treatment 68.8%
Sajid 2016(47)	Stage not reported. Metastatic included,  More aggressive tumours: Gleason Score: Wii fit arm= 7.1, EXCAP= 8, Control = 7.6	Average time on ADT: 64.4months  Other treatments not reported
Winterstone 2012(48)	Stage not reported. Local disease 71%; Advanced disease 20%; metastatic disease 9%	Surgery 67%; Radiotherapy 44%; Chemotherapy 3%; ADT 17.5%
Demark-Wahnefried (53) Fresh Start	Stage I 39%; Stage II 52%; Stage III 9%; no metastatic disease.	Surgery 85%; Radiotherapy 44%; Chemotherapy 27%; Hormone 39%; Other 5%
Demark-Wahnefried (58) Lead	Stage not reported. Local disease only, no metastatic disease.	Treatments not reported



<b>Author</b>	<b>Prostate Cancer Stage of Disease</b>	<b>Treatment Type (Combined RCT arms)</b>
Renew (60)	Stage not reported. Local disease only, no metastatic disease.	Treatments not reported
Forbes UCAN (50)	Stage of change not reported. Disease status: disease free 96%. Recurrence 6%.	Treatments not reported ; Active Treatment (Hormone 26%); No active treatment 79%
Ibefeit (63)	Stage not reported. Low cancer risk 49%; High cancer risk 51%	Surgery 79%; Radiotherapy 17%; Chemo 27%; Hormone 32%
James, ENRICH (65)	Stage not reported. Cancer in remission 68.5%. Number of cancer diagnosis; 1 (89.8%); 2 (8.3%); 3+ (1.9%)	Surgery 93.6%; Radiotherapy 66%; Chemotherapy 73.6%; Hormone therapy 57 %

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## ***Chapter 3***

Exploring Prostate Cancer Survivors' Perceptions of Non-tailored Physical Activity  
Messages: Implications for Computer-Tailored Interventions.

## Statement of Authorship

### Statement of Authorship- Chapter 3

Title of Paper	Exploring prostate cancer survivor's perceptions of non-tailored physical activity messages: Implications for computer-tailored interventions.
Publication Status	
Publication Details	

### Principal Author

Name of Principal Author (Candidate)	Amy Finlay		
Contribution to the Paper	Conceptualization, methodology, visualisation, project administration, writing- original draft preparation, publication application.		
Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	9 / 7 / 19

### Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- the candidate's stated contribution to the publication is accurate (as detailed above);
- permission is granted for the candidate to include the publication in the thesis; and
- the sum of all co-author contributions is equal to 100% less the candidate's stated contribution

Name of Co-Author	Gary Wittert		
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Exploring Prostate Cancer Survivors' Perceptions of Non-tailored Physical Activity Messages: Implications for Computer-Tailored Interventions.

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#### CRediT statement/ author contributions

- Amy Finlay: Conceptualization, methodology, data curation, formal analysis, visualisation, project administration, writing- original draft preparation.
- Gary Wittert: Data curation, visualization, funding acquisition, software reviewing and editing, and supervision.
- Camille E Short: Conceptualization, formal analysis, Funding acquisition, data curation, validation, methodology, visualization reviewing and editing, and supervision.

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## Abstract

**Objective:** The majority of prostate cancer survivors are insufficiently active to obtain health benefits. Online computer-tailored programs may be an effective way to provide physical activity guidance en masse, however strategies are needed to ensure program relevance. This study aims to obtain consumer feedback on non-tailored messages to identify message components that would need altering to ensure relevance and acceptability of physical activity messages among men with prostate cancer.

**Method:** Sixteen Australian prostate cancer survivors gave feedback on four non-tailored physical activity messages. A qualitative descriptive approach was used to identify issues.

**Results:** Participants reported that non-tailored messages did not account for differences in baseline fitness level and comorbidities, or preferences for exercise. There were also disparities in the perceived value of goal setting generally. Most men found that the length and tone of the messages were adequate but stressed the importance of simplicity and brevity.

**Conclusion:** Obtaining feedback from prostate cancer survivors was successful at identifying tailoring needs necessary for making computer-tailored messages relevant.

**Practice Implications:** Physical activity messages targeting prostate cancer survivors should take baseline fitness level, comorbidities and exercise preferences into account, explain the value of goal setting and be presented in a simple and brief format.

## Introduction

The majority of prostate cancer survivors are not physically active enough to mitigate the long-term sequelae following prostate cancer (1). Oncological guidelines suggest avoiding sedentary behaviour and working towards 150 minutes of moderate to vigorous aerobic activity and participating in two resistance-training sessions per week to obtain health benefits (2). To increase exercise levels, there are calls for physical activity programs that can be integrated into usual care (3). However, providing support to the growing population of survivors in a way that is affordable and accessible, whilst also being appealing, effective and safe, is a major health service challenge (4).

Computer-tailored interventions may help to address this challenge, at least in part. Programs using this method of intervention delivery have been somewhat successful in both the general population, and amongst cancer survivors (5, 6). Computer-tailored interventions are most often delivered digitally via websites and mobile phone applications (7). In these interventions, customized advice and feedback is delivered to participants in an automated way using expert system technology (8). Messages are pre-written ahead of time, labelled and stored in a message library. Participants are then assessed, and specific messages are selected for each recipient based on their responses to the assessment(s). By doing so, the users of the intervention receive content that is more personally relevant and provided with interactive learning opportunities. This enhances efficacy compared to non-tailored digital interventions, whilst also allowing for widespread delivery at a low cost (8, 9).

Although effective, the development of computer-tailored interventions is a complex process. The developer must think about what topics they want to cover, how the messages should vary based on what characteristics, and how each characteristic will be assessed. There are detailed program planning guides (e.g., (8)) that help to ensure the intervention is addressing the most important determinants of behaviour using sensible evidence-based approaches. However, specific strategies that help to ensure messages are relevant and reduce unnecessary tailoring appear to be absent in the literature, especially strategies that balance these two aspects. This is an important consideration for progressing the field of computer tailoring. Increased relevance has been shown to be the primary mechanism driving increased efficacy in computer-

tailored interventions (10). Increases in program relevance leads to greater attention towards and elaboration of health messages, which leads to superior persuasion (11). As such, enhancing relevance has traditionally been the primary goal of computer tailoring. To achieve this, hundreds or thousands of messages are usually developed for use in computer-tailored interventions. This enhances the relevance compared to generic (one-size fits-all) or targeted (this size fits your group) messages, but significant portions of users have still been found to report low-moderate perceived relevance of content in computer-tailored interventions (12, 13).

One strategy that may assist intervention developers to streamline their tailoring variable choices are to present intended end users with non-tailored health messages and obtain their feedback. Presenting participants with generic health promotion messages and receiving end users' feedback could help to identify which parts of the message are considered superfluous and/or irrelevant. For example, which demographic, psychosocial, behavioural, health dimensions are most important to tailor, saving time and money in the intervention development. This method also has the added value of identifying other intervention characteristics, such as message tone and framing that could be improved. This approach is in line with current advice that suggests including the intended user of the intervention within the design process as it is likely to increase future engagement (14). Overall, the approach has potential to make the tailoring process more efficient, whilst also increasing message appeal and comprehension. This health message feedback study was embedded as part of the intervention development for a pilot online exercise promotion program for prostate cancer survivors (results of which will be published elsewhere). The aim of this qualitative study was to explore intended end-users' perceptions of non-tailored messages in order to identify components that may need tailoring in the future to improve message acceptability and relevance

## Material and Methods

### *Study Facilitator Characteristics*

A Caucasian female PhD student (AF) with undergraduate studies in psychology and public health led conduction of the study. The relationship between parties was established by email communication or through face-to-face recruitment efforts at

community events. All participants were informed the study was part of a PhD program, and that the findings would be used to guide the development of a future online intervention.

### *Study Design*

This study follows the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines (15). The University of Adelaide Human Research Ethics Committee granted ethical clearance (H101-2017). All interested participants were provided with a copy of an information sheet and consent form and instructed to call or email the researcher to participate in this study (AF). After receiving consent, participants were invited to partake in this feedback study after completing a separate qualitative interview, the results of which will be published elsewhere.

### *Participants and Setting*

The feedback study was completed either online or on paper. The paper-based version was completed either as a hard copy via the post, or while the researcher was in the room with the study participants located in the South Australian Health and Medical Research Institute. To be eligible for this study, men must: a) have been diagnosed with localized or locally-advanced prostate cancer (non-metastatic), b) be over the age of 18, c) be considered to be in remission, d) have completed active treatment and e) be able to read and write fluently in English. Recruitment was conducted predominantly within South Australia, as this was the primary research location. Sampling and recruitment strategies were purposive in nature, with both metropolitan and rural participants were invited to participate. This included placement of flyers in local council newsletters and doctors' waiting rooms, promotion of the study through a post on social media, the use of the University of Adelaide's men's health register, as well as emails and presentations to prostate cancer support groups. Local urologists were also contacted and requested to pass on information to potential participants. The reach of recruitment efforts was community flyer based and as the participants contacted the researcher, refusal to participate rates could not be calculated.

### *Procedure*

The feedback study took participants approximately 10 minutes to complete. Participants could choose to have the study sent to them via online survey, or via the post (with reply paid and pre-addressed envelopes). Participants received a \$25 department store gift card to compensate them for their time. Participants completed a small demographical questionnaire that included asking for their age, time since last treatment, education, and a single question on their global health status (extracted from the Quality of Life QLQ-C 30 (16)). The feedback was solicited via open text box messages via a survey. The survey was available in both paper and online formats. Paper versions were sent and received in prepaid envelopes via the postal service.

### *Data Collection*

Each participant was asked to read the same four non-tailored physical activity messages with open-ended text boxes to provide written qualitative feedback (see Table 1). Participants were given the same instructions to consider if the message was relevant to their circumstances, if the message language was acceptable, and if the tone and length of the message was adequate. The purpose of presenting the same non-tailored message to participants was so that each person was able to identify what they perceived to be missing from the single non-tailored messages. Identifying variations in feedback would indicate that tailoring might need to be further explored within a specific message.

### *The Non-Tailored Messages*

It is recommended that health promotion messages be developed based on sound behavioural theory (17). This is because behavioural theory facilitates an understanding of the factors that determine behaviour change and can also offer guidance as to how to address these determinants to influence behaviour (17, 18). The messages for this study were based on Social Cognitive Theory (SCT) (19). This theory was selected because it is commonly used in behavioural research among cancer survivors (20) as well as in

men's health (21). According to SCT, key determinants of behaviour change include knowledge of health risks and benefits, perceived self-efficacy (confidence to perform the behaviour), outcome expectations (the expected benefits and costs of performing the behaviour), goals, perceived facilitators and social support. The messages were developed to target each of these constructs, corresponding to behaviour change strategies (CALO-RE taxonomy of behaviour change (22)), previously mapped to SCT constructs by Stacey and colleagues (20). An overview of the messaging strategies used, and how they relate to SCT is provided in Table 1, and for the copy of the study outline see Supplementary Table 1. Website based exercise advice, non-tailored to those with cancer, was also used to inform the health messages. For instance, goal-setting ideas aimed to those with cancer (23), and examples of moderate/vigorous activities pitched at those with prostate cancer (24). The messages were relatively short, as per recommendations for computer-tailored messages (8) and presented in a single paragraph (see Table 1). This study used a practical method of soliciting feedback on non-tailored health messages highlighting tailoring opportunities within future messages of a health promotion online intervention. In terms of theory, tailoring is based on the theoretical assumption that more relevant information will increase the persuasion of the health message that prompts behaviour change. This assumption is based on the theories of message persuasion posited by the Elaboration Likelihood Model (18).

Insert Table 1 here

### *Data Analysis*

A general content analysis was undertaken, whereby the AF became familiar with the data, coded and interrupted the written feedback of each message and between each message (25). AF viewed the data from a pragmatic approach the 'real world' context (26). The data was considered in relation to the questions of relevance and acceptability, as well as the message length and language. The researcher (AF) then discussed the data with a second researcher (CES) in order to confirm commonalities within the feedback. All authors reviewed and agreed on illustrative quotes for each suggested finding. If there was both agreement and disagreement in the data regarding the relevance of the non-tailored message, this might indicate that the message was not meeting some individual experiences and therefore requires tailoring.



## Results

A total of 16 participants, averaging 71.1 years of age ( $\pm 7.1$  years), and 5.1 years ( $\pm 4.6$  years) since their last prostate cancer treatment, provided written feedback on the messages via survey. For participant characteristics see Table 2. Ten participants completed the online survey version, and six participants preferred a paper version of the survey. Approximately half of the participants perceived their health as very good or excellent, had completed post high school education, and lived in a metropolitan area. Participants' responses were grouped into two broad feedback categories; a) perceptions of message presentation and b) perceptions of message content. Each of these is described below with illustrative quotes presented in Table 3.

Insert Table 2: Demographical characteristics about here

### *Perception of Message Presentation*

Several participants felt that the messages were a little hard to understand, mostly in terms of the presentation of the message as a single long paragraph. In general, the language used within the messages was perceived as acceptable, though one participant suggested using the more familiar word 'cardio' instead of 'aerobic' activity. Some men noted the messages came across as too authoritative and too formal, perhaps indicating issues with the tone of the message. Variations in the perception of the amount of information were also noted (too much, enough, or not enough information provided) in the feedback.

### *Perception of Message Content*

Information contained within the messages was generally well regarded, however some issues with the perceived relevance of the messages were identified (see Table 3). This was especially the case for messages relating to knowledge and guidelines, social support, and goal setting-based information. For example, comorbidities including

musculoskeletal and medical conditions were often mentioned as something that the guidelines and goal-setting messages did not take into account. For some, the current guidelines did not seem achievable. This may have been compounded by the examples used to describe exercises. One participant noted that the strength examples are for “already fit people”, and that older or less fit people would need different examples. Most participants had no challenges relating to the goal-setting message. However, a couple of participants did not feel that the goal-setting message was appealing. For example, the formalized goal setting approach (S.M.A.R.T goals) was considered to be “...a lot of effort before making a start” (#8, 66 years). Participants’ reaction to the social support message was mixed. While some participants indicated they agreed with the messages, others seemed to reject it based on their perception that exercise is an “individual activity”. In contrast, the message relating to outcome expectations (explaining the benefits of exercise) was generally well received, with only one participant who reacted adversely to the perception of an authoritative message (see Tables 1 and 3).

Insert Table 3 about here

## Discussion

This study aimed to inform the development of a future online computer-tailored intervention to promote physical activity among men with non-metastatic prostate cancer. The feedback on the non-tailored health messages provided insight into practical ways to present health promotion information. The feedback also gave insights into ways to reduce tailoring waste (i.e. tailoring on variables that are not necessary to increase relevance), which may help to improve the cost-effectiveness of the intervention.

### *Message Length and Presentation*

The tone and language used within the messages was mostly considered adequate. Though some men found the language too formal, or too authoritative. Reframing messages to be more suggestive rather than prescriptive may increase message acceptance, that is, promoting a partnership based approach rather than a trainer-trainee approach (7). This may help to increase feelings of autonomy, and tap into intrinsic

motivation (27, 28). Autonomy and control are important factors of masculinity to take into account when supporting prostate cancer survivors, as the diagnosis and ‘cancer journey’ may lead men to a sense of loss of autonomy (29). Therefore, from a health service delivery point of view, autonomy may increase motivation to engage with the service and the overall behaviour change process (14). Many participants perceived a paragraph length as ‘too long’, and key points may have been lost. Additionally, the presentation of the message was considered hard to read and therefore a dot point approach to health information delivery was recommended, similar to other recommendations (30).

There were noted differences in the feedback relating to the amount of information given in the non-tailored health messages. This may relate to the need for cognition, as postulated by drawing from the Elaboration Likelihood Model of Persuasion (18) with some individual’s requiring much more information to be persuaded into behaviour change. As noted in a recent review (11), while taking into account preferences for information, the relevance of the information may be more important. Therefore, a hybrid approach that takes both the cognition informational preferences with the relevance of the information should be considered (11). In a computer-tailored intervention, one could meet this need in a few practical ways. For example, the cognition style could be assessed, and then the messages are matched to the cognition and informational processing preference. Alternatively, providing a ‘see more’ option at the bottom of the main message, or providing access to more in depth messages or articles in an ‘online library ‘could allow for self-tailoring, which would also increase autonomy.

Insert Table 4 about here

### *Tailoring Guidance within Health Messages*

Presenting and assessing brief consumer feedback was highly effective at identifying tailoring targets (see Table 4). For example, comorbidities were a key concept that impacted the perceived relevance of the messages by most participants. Older adults tend to have a wide range of morbidities (e.g., musculoskeletal pain, heart disease, and neuropathy (31, 32), to various levels of functional impairment. Given the

sheer amount of combinations of different comorbidities for any individual, this would result in hundreds of tailored permutations. To streamline this process and avoid over tailoring (saving time and money), a functional impairment approach could be considered instead of a combinational comorbidity approach. Tailoring could be based on severity and location of issues, or perceived functional limitations (i.e., self-reported functional capacity for performing specific movements or activities) rather than the presence or absence of specific diseases.

While the objective of health promoters is to support survivors to reach activity levels consistent with clinical and evidence-based guidelines, it should be recognised that participants do not always value them. In this study, some participants found the guidelines not relevant, unappealing or unreachable. As such, providing feedback on participants' activity in comparison to the guidelines may be demotivating to some participants. This finding has been echoed in a study focusing on breast cancer survivors (9), and the authors suggest that tailoring should instead be based on participants' own goals, and have less emphasis on the comparing activity week by week to the guidelines. Importantly, from a public health perspective, allowing participants to progress at their own pace may result in them doing more exercise, not less (33).

In terms of goal setting, some men found the formalised goal setting approach (i.e., using the S.M.A.R.T principle) unappealing. This implies that this style of formalized approach to goal setting may not always be appropriate (34), or potentially the messages would need to frame *why* goal setting and how *specific* goal setting is valuable. Swann and Rosenbaum (2017) noted that this might be the case, reiterating Locke & Latham's (1991) goal setting theory, which proposes that if a goal is too challenging it may cognitively overload the individual, leading to an abandonment of the exercise goal (35). More research is needed to explore what form of goal setting will motivate different program users in future interventions.

The men in this study expressed different social support preferences and therefore the message was not relevant to all participants. Previous literature has identified that 40-50% of participants with a diagnosis of cancer prefer to exercise alone, whereas others wish to be in a gym class, or exercising with a partner, friend or family (36, 37).

Given this, programmers will need to tailor the program to meet these differences in preferences when giving exercise advice. For example, for someone who prefers to exercise alone, health advice could centre upon celebrating individual motivation, but also mention ideas about utilising social supports in other ways (e.g., by sharing goals and progress over time to others). In contrast, for someone that prefers to exercise with others, one can celebrate this use of social support but also mention that the user will need to identify strategies to cope if the support is unexpectedly ceases, such as a cancelled class or injury of exercise partner.

### *Limitations*

While this study reached data saturation, the open-ended text boxes did not allow for probing responses to obtain more detailed feedback. Thus, feedback and data analysis were limited. Further insights may be gained by examining message relevance and acceptability in focus groups, talk out loud tests, or in-depth interviews. This may generate more in depth data (38, 39). The baseline levels of physical activity were not collected, and therefore comparing perceptions of the messages with their fitness level could not be assessed. The ethnicity of participants was not assessed and potentially limits the generalisability of the data. Furthermore, participants in this study tended to be long-term cancer survivors, and therefore the data and tailoring insights may not be applicable prostate cancer survivors who have had their treatments more recently.

### **Conclusion**

Tailoring health messages to be appropriate to the individual is important if a health message is to be perceived as relevant, and therefore more persuasive. Given the rise of online research in recent decades, designing relevant and engaging online interventions is of importance (6, 40). This study gathered useful data in an affordable and efficient way to guide the development of a more person-centred, and hopefully more relevant, intervention to support prostate cancer survivors to become more active.

Table 1: Message Development with Social Cognitive Theory Mapped to Behaviour Strategies

	SCT component	Behavioural strategy ID and description	Messages
Message 1	Knowledge	1) Provide information of consequences of behaviour in general	<p><b>How much activity is recommended?</b> It is recommended that cancer survivors who are able to participate in 150 minutes of moderate-vigorous aerobic activity each week. Another way of putting it is half an hour of activity on most days, at a pace that makes you sweat after about 10 minutes (moderate exercise) or sweat almost instantly (vigorous exercise). Examples of aerobic exercises include walking, cycling, gardening, dancing, golf (walking and carrying clubs) cricket, tennis, mowing the lawn etc. In addition to aerobic exercise, two sessions of resistance-based activities (also referred to as strength-based) are also recommended each week, ensuring you work all major muscle groups. Examples of resistance-based exercises include push-ups, squats, sit-ups, and bicep curls. Evidence from many research trials has shown that exercise is safe for cancer survivors and should be participated in regularly to obtain the most benefits. Don't</p>
	Self-efficacy	2) Provide instruction on how to perform the behaviour	

			worry if you don't meet the main guidelines straight away. Some exercise is more beneficial than none. You can start small and build your way up to meeting the guidelines over time.
Message 2	Goal setting	5) Goal setting (behaviour); 7) action planning	<b>How to get started and stay on track.</b> The first step is to set some goals. The Cancer Council recommends SMART goals. Goals that are SMART are: specific, measurable, achievable, realistic and timely. Think about what a SMART goal for you would be. Once you have your goal worked out the next step is to make a specific plan. Think of exactly when, where and with who you are going to exercise to achieve your goals. Write it down somewhere and schedule it into your week. This is about making the time. Once you have these two things sorted you are ready to get started. To help you stay on track we recommend monitoring your progress. You can do this by keeping pen and paper records or by using a pedometer or fitness tracker. The best method will depend on your goal and your level of comfort with technology. Monitoring your progress will be useful for adjusting your plan and it can also be quite motivating.
	Outcome expectations	16) Prompt self-monitoring (behaviour)	

Message 3	Knowledge	1) Provide information of consequences of behaviour in general; 2) provide information of consequences of behaviour to the individual	<b>What are the benefits of exercise?</b> Exercise has many general benefits for your physical and mental wellbeing. It can: strengthen muscles and bones and improve circulation, help you maintain or achieve a healthy weight, improve your energy levels, improve your mobility and balance, improve appearance and self-esteem, help you cope with stress, anxiety and depression. It can also provide reduce the risk of, or help manage, high blood pressure, heart disease, stroke, diabetes, osteoporosis and some cancers.
Message 4	Outcome expectations/ Facilitator	29) Plan social support/ social change	<b>Do I need an exercise partner?</b> Exercising alone can work for some, but other times it's good to find someone in your life, such as a partner, or a friend to keep you accountable. While you will be in charge of your activity, it always helps to have someone who knows what changes you are making. Exercising with others can also make it more enjoyable. You might choose a mix of exercising at home or outdoors and attending a group program. The structure and safety of a supervised program can be a great place to start, while your own activities can keep things interesting. Another option is to



			<p>join a sporting club. Belonging to a group provides a social outlet as well as physical benefits, and often helps with motivation</p>
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Table 2: Participant characteristics

Characteristic	Total (N=16)
Age (years)	M71.7 (SD5.1)
Time since last treatment in (years)	M5.1 (SD4.6)
Post high school education (N/16)	9/16
Treatment (N/16)	
<i>Surgery</i>	6/16
<i>Surgery + Radiation</i>	1/16
<i>Surgery + Hormone</i>	1/16
<i>Radiation</i>	4/16
<i>Radiation + Hormone</i>	2/16
<i>Hormone</i>	2/16
Single item: Global Health Status: Quality of Life QLQ-C 30	
<i>Excellent</i>	2/16
<i>Very Good</i>	5/16
<i>Good</i>	8/16
<i>Fair</i>	1/16
<i>Poor</i>	0/16

Table 3: Message Presentation and Message Content Participant Feedback, (#Identification number, age)

<b>Message 1: Guidelines and knowledge</b>	
<p><i>Perception of message presentation</i></p> <p><u>Language</u></p> <p>“Language ok” (#1, 71)</p> <p>“Aerobic=cardio.” (#8, 66)</p> <p><u>Tone</u></p> <p>“Tone of message ok -It is ok.” (#15, 62)</p> <p>“Yes about the language and tone appropriate” (13, 56)</p> <p>“Probably authoritarian, don’t tell me what do!” (#3, 75)</p> <p>“Authoritative” (#5, 75)</p>	<p><i>Perception of message content</i></p> <p><u>Relevance</u></p> <p>“Content relevant, well pitched information on the right level” (#1, 71)</p> <p>“I do 150 min + every week. Totally agree with the summary but work but within your physical limits” (#10, 74)</p> <p>“No it is not relevant to my age / lifestyle/ work commitments.” (#15, 62)</p> <p>“Agree, but in my case I was doing it anyway (small farm.)” (#10, 74)</p> <p>“These guidelines may be ideal, but I can’t achieve them.” (#15, 62)</p> <p>“I have a heart problem being short of breath under stress. I also am restricted by a knee injury, however at my own pace I can manage.” (#15, 83)</p>

<p><u>Length</u></p> <p>“The message is a bit long.” (#2, 71)</p> <p>“Too many words.” (#15, 62)</p> <p>“Too much information.” (#15, 62)</p> <p>“Presented like in the above paragraph- its difficulty to read and to put this in some sort of order for the reader. I think you have to keep it simple and in sub section or bite sized pieces, and friendly, like the last sentence.” (#13, 56)</p>	<p>“Needs examples. ”(#5, 75)</p> <p>“Strength examples are for already fit people- for older/less fit can use softer exercise examples (small weights, wall push etc.)” (#8, 66)</p> <p><u>General comments</u></p> <p>“Appropriate” (#6, 65)</p>
<p><b>Message 2: Goal setting, action planning, and self-monitoring</b></p>	
<p><i>Perception of message presentation</i></p> <p><u>Language</u></p> <p>“Underline the when where and with whom.” (#5, 75)</p> <p><u>Tone</u></p> <p>“Authoritarian, and implies I’m not currently doing enough.” (#4, 75)</p> <p>“Go back one step- why do I need these fancy goals? What penalty is there for doing nothing? What do you mean?” (#3, 75)</p>	<p><i>Perception of message content</i></p> <p><u>Relevance</u></p> <p>“It is relevant to everyone!” (#2 71)</p> <p>“Relevant” (#7, 78)</p> <p>“Probably [relevant]” (#4, 75)</p> <p>“Definitely not for everyone.” (#8, 66)</p> <p>“Because of my severe debilitating arthritis I am very limited to what exercise I</p>

<p><u>Length</u></p> <p>“Appropriate- yes, nice and brief and to the point.” (#2 71)</p> <p>“A bit brisk [length]” (#4, 75)</p> <p>“I prefer the message to be in point form, less words, quicker to digest.” (#15, 62)</p> <p>“Just enough [information]” (#4, 75)</p>	<p>can do. Short 20-30 min walk can be very uncomfortable.” (#14, 78)</p> <p>“Looks like a lot of effort before making a start. Some may prefer to start slow, develop plans and commit as they go.” (#8, 66)</p> <p>“I would keep my own records to see how I improve (pen and paper) I would need a step counter to monitor it. Working with someone else could be good.” (#11, 73)</p> <p>“We have data sheets to measure progress. Group of friends that normally show up to make more interesting.” (#9, 61)</p>
<p><b>Message 3: Outcome expectations, knowledge</b></p>	
<p><i>Perception of message presentation</i></p> <p><u>Language</u></p> <p>“A bit too formal.” (#2, 71)</p> <p><u>Tone</u></p> <p>“A bit too formal.” (#2, 71)</p> <p><u>Length</u></p>	<p><i>Perception of message content</i></p> <p><u>Relevance</u></p> <p>“Relevant” (#2, 71)</p> <p>“I like this- motivating.” (#8, 66)</p> <p>“Agree with all the above.” (#11, 73)</p> <p>“This message is good.” (#12, 76)</p> <p>“Ordering me about?? Am I not doing ok enough under my own steam?? Are you</p>

<p>“Too much info.” (#2, 71)</p> <p><u>General Comment</u></p> <p>“Appropriate” (#6, 65)</p>	<p>suggesting I will die if I don’t conform?” (#3, 75)</p> <p>“Give example[s]” (#3, 75)</p> <p>“The advice is good, but would love to see some examples given for different abilities. For e.g. Health and fit 50yr male is quite different to an older not so fit male. You could give some generic answers with referrals to a sports physio or similar personal trainer. Setting a generic goal could be a start, e.g. if you walk without pain for 10 mins do that at the same time in exercise clothes; two weeks increase to 15 min. Something like that. Again the info is good by needs to be non-tailored.” (#13, 56)</p> <p>I would mention that exercise is good for the male’s sexual health as well. I would specifically mention which cancers have shown to be reduced.” (#13, 56)</p>
<p><b>Message 4: Social Support</b></p>	
<p><i>Perception of message presentation</i></p> <p><u>Language</u></p> <p>“Well written, level about right” (#1, 71)</p> <p>“The info is good and appropriate and well written like the rest of the statement.” (#13, 56)</p>	<p><i>Perception of message content</i></p> <p><u>Relevance</u></p> <p>“Group session is best for me.” (#9, 61)</p> <p>“It is good to be able to exercise with a partner/group and able to set challenges.” (#12, 76)</p>

<p>“Not ‘accountable’ try ‘on track’ or similar.” (#8, 66)</p> <p><u>Tone</u></p> <p>“False enthusiasm is a bit of a turn off.” (#3, 75)</p> <p><u>General comment</u></p> <p>“Appropriate” (#6, 65)</p>	<p>“Not relevant as I am single but makes a lot of sense.” (#1, 71)</p> <p>“I am usually too busy to organise a partner, it is much easier to exercise on my own.” (#2, 71)</p> <p>“Hell no! I’m a loner.” (#3, 75)</p> <p>“Exercise is an individual activity, I would exercise by myself.” (#4, 75)</p> <p>“Info ok” (#1, 71)</p> <p>“It is good to be able to exercise with a partner/group and able to set challenges” (#12, 76)</p> <p>“There is a lot of truth in the message, but group exercising requires more planning than I am prepared to do.” (#2, 71)</p> <p>“Good information but not my thing at all” (#3, 75)</p> <p>“The info is good and appropriate and well written like the rest of the statement. But I would focus on exercises with others is much more fun, as demanding as you want and is good for your mental health and cheering on a bit with groups” (#13, 56)</p>
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Table 4: Tailoring Recommendations from Participant Feedback

Participant Feedback	Tailoring recommendations for older long term cancer survivors
Fitness level: men noted that standard messages did not take into account their level of current fitness and that the guidelines are not achievable	Fitness level should be tailored within goal setting and the examples of activities in messages. For example, those who have more comorbidities or have not exercised in a while need to be reminded to start small and with gentle activity examples, like walking and leg and arm raises, rather than providing examples like push ups or jogging. Place less emphasis on the guidelines, but instead encourage participants to continue to build on their own goals.
Co-morbidities	Tailor messages based on functional impairment or perceived functioning limitations (i.e., self-reported functional capacity for performing specific movements or activities) rather than specific diseases.
Goal setting approach: some men found that a formalised goal setting approach was not relevant to them.	Provide a less formal pitch to goal setting (such as explaining to choose small goals, how goals help, and why its important to have goals); as well as formalised goal setting (e.g. SMART Goals) as tailoring options.
Social support preferences: some men felt that the messages were pushing for social support and that this was not relevant to them	Tailor to social support preferences. For those who prefer to exercise alone, perhaps encourage this, but also note that if circumstances change or they find that they are not meeting their goals, then they should consider asking a partner / family / friend or health professional to keep them accountable



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## Supplementary Table 1



Contact: Amy Finlay PhD Student, University of Adelaide

Freemasons Foundation Centre for Men's Health,  
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Email: amy.finlay@adelaide.edu.au

### Prostate Cancer Research Project:

Making things more relevant: Chat to us about prostate cancer and lifestyle change support: Section 4 (survey).

Making things more relevant: What is Missing?

### **What is missing from these messages?**

We have sourced these physical activity messages from existing resources and we would like your opinion on them. This will take 10-15 min

Keep in mind:

- Are they relevant to your circumstance?
- Would they be relevant for other men with prostate cancer?
- Is the language and tone of the messages appropriate?
- Do you find it too formal/causal?
- Too much information or not enough?
- Tell us what is missing and why!

If there is not enough space, please attach a new sheet of paper with your thoughts.

**How much activity is recommended?** It is recommended that cancer survivors who are able participate in 150 minutes of moderate-vigorous aerobic activity each week. Another way of putting is half an hour of activity on most days, at a pace that makes you sweat after about 10 minutes (moderate exercise) or sweat almost instantly (vigorous exercise). Examples of aerobic exercises include walking, cycling, gardening, dancing, golf (walking and carrying clubs) cricket, tennis, mowing the lawn etc. In addition to aerobic exercise, two sessions of resistance-based activities (also referred to as strength-based) are also recommended each week, ensuring you work all major muscle groups. Examples of resistance-based exercises include push-ups, squats, sit-ups, and bicep curls. Evidence from many research trials have shown that exercise is safe for cancer survivors and should be participated in regularly to obtain the most benefits. Don't worry if you don't meet the main guidelines straight away. Some exercise is more beneficial than none. You can start small and build your way up to meeting the guidelines overtime.

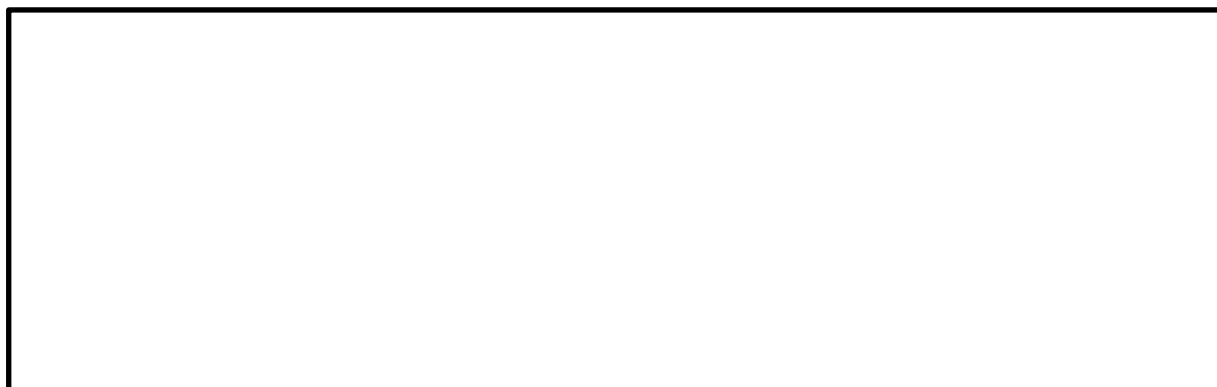
Comment:

**How to get started and stay on track.** The first step is to set some goals. The Cancer Council recommends SMART goals. Goals that are SMART are: **s**pecific, **m**easurable, **a**chievable, **r**ealistic and **t**imely. Think about what a SMART goal for you would be. Once you have your goal worked out the next step is to make a specific plan. Think of exactly when, where and with who you are going to exercise to achieve your goals. Write it down somewhere and schedule it into your week. This is about making the time. Once you have these two things sorted you are ready to get started. To help you st



on track we recommend monitoring your progress. You can do this by keeping pen and paper records or by using a pedometer or fitness tracker. The best method will depend on your goal and your level of comfort with technology. Monitoring your progress will be useful for adjusting you plan and it can also be quite motivating.

Comment



***What are the benefits of exercise?*** Exercise has many general benefits for your physical and mental wellbeing. It can: strengthen muscles and bones and improve circulation, help you maintain or achieve a healthy weight, improve your energy levels, improve your mobility and balance, improve appearance and self-esteem, help you cope with stress, anxiety and depression . It can also provide reduce the risk of, or help manage, high blood pressure, heart disease, stroke, diabetes, osteoporosis and some cancers.

Comment:



***Do I need an exercise partner?*** Exercising alone can work for some, but other times it's good to find someone in your life, such as a partner, or a friend to keep you accountable. While you will be in charge of your activity, it always helps to have someone who knows what changes you are making. Exercising with others can also make it more enjoyable. You might choose a mix of exercising at home or outdoors and attending a group program. The structure and safety of a supervised program can be a great place to start, while your own activities can keep things interesting. Another option is to join a sporting club. Belonging to a group provides a social outlet as well as physical benefits, and often helps with motivation.

Comment:

A large, empty rectangular box with a black border, intended for a user to enter a comment.

Thank you for your thoughts this will allow us to make more relevant information available for men with prostate cancer

## ***Chapter 4***

Going online? Perspectives from Prostate Cancer Survivors for Designing Online  
Computer-tailored Physical Activity Programs.

## Statement of Authorship

### Statement of Authorship- Chapter 4

Title of Paper	Going online? Perspectives from prostate cancer survivors for designing online computer tailored physical activity programs.
Publication Status	<b>Manuscript</b>
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### Principal Author

Name of Principal Author (Candidate)	Amy Finlay		
Contribution to the Paper	Conceptualization, methodology, interview schedule, interviewer, transcription visualisation, project administration, writing- original draft preparation, publication application.		
Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	9/7/19

### Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- the candidate's stated contribution to the publication is accurate (as detailed above);
- permission is granted for the candidate to include the publication in the thesis; and
- the sum of all co-author contributions is equal to 100% less the candidate's stated contribution

Name of Co-Author	Gary Wittert		
Contribution to the Paper	10% Funding acquisition, manuscript reviewing/ editing, and supervision.		
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Name of Co-Author	Camille E Short:		
Contribution to the Paper	20% Conceptualization, funding, blinding of 3 transcripts for coding, methodology design, visualization, manuscript reviewing/ editing, and supervision		
Signature		Date	9/8/19

Going online? Perspectives from Prostate Cancer Survivors for Designing Online Computer-tailored Physical Activity Programs.

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## Abstract

**Introduction:** Online computer-tailored programs can assist prostate cancer survivors to become more physically active. However, creating acceptable, efficacious, and engaging programs are challenging. Therefore, input from users may improve program relevance. This study aimed to inform future online computer-tailored programs by exploring the perspectives and preferences of prostate cancer survivors.

**Method:** Sixteen prostate cancer survivors (mean age 71.1yrs  $\pm$  7.1yrs, mean time since treatment = 5.1yrs  $\pm$  4.6yrs) in remission for low risk prostate cancer were recruited through flyers, community engagement, and urologists. Phone or face-to-face semi-structured interviews were conducted with participants until data saturation was reached. Thematic analysis was used to identify themes from the verbatim transcripts.

**Results:** Prostate cancer experience themes included *pre-treatment* and *from treatment onwards*, suggest that men value their health, despite ongoing psychological and physical issues. Physical activity themes were coded into *behaviour* and *determinants*, in which the participants valued being active, though many faced challenges such as comorbidities, ongoing incontinence, poor weather and motivation. Three technology-related themes (*the Internet*, *preferences for websites* and *preferences for an online physical activity program*) signified that daily Internet use was commonplace. Participants described preferences for a concise, short and simple online program that contains video and text based advice. There were mixed opinions on whether ‘free choice’ or ‘step-by-step’ was more suitable for the website architecture.

**Conclusion:** Short and simple online tailored programs with flexible delivery may be acceptable to men with prostate cancer. Future research is required to explore the impact of website architecture on behaviour.

## Introduction

Most prostate cancer survivors are considered insufficiently active to receive the associated psychological and physical health benefits of exercise [1]. According to the oncological exercise guidelines, cancer survivors should aim for 150 minutes of moderate to vigorous aerobic activity and two resistance training sessions per week [2]. This is considered sufficient to obtain clinically meaningful health benefits. For those who are seeking distanced based physical activity programs, one wide-reaching strategy is to utilise online computer-tailored programs [3, 4]. Computer-tailored programs use algorithms to modify the health information that is received by the end-user. By eliminating extraneous information, the health messages are personalised to the user's unique combination of demographical, psychosocial, and health characteristics, offering relevant and timely support [5, 6]. Tailored programs are more persuasive and therefore are more efficacious compared to non-tailored programs [7]. Typically, computer-tailored interventions deliver modules of information to participants according to a pre-determined linear schedule (e.g., once a week, fortnightly, monthly etc.) [8, 9]. Known in the literature as 'tunnelling' [10], this form of module delivery can reduce the overall cognitive burden to the participants [10]. These interventions can be effective [4], however, there is room for improvement.

Many digital interventions cite issues with the loss of participant engagement, which can impact a program's efficacy [8, 9]. Engagement (the subjective user experience and extent of program usage) is thought to impact an intervention's effectiveness by influencing the depth of cognitive involvement with the behaviour change process (e.g., effort and attention towards set goals) [8, 11]. To improve engagement within digital health interventions, there are calls for developers to consider a more person-centred approach [12]. This includes increasing opportunities for participants to have more choice in how they interact with the digital program, thereby promoting autonomy and potentially enhancing program engagement [12]. For example, an autonomy focused behaviour change program might provide participants with difference choices in the type of behavioural goals they make, or if the program is modular in nature, then a choice in how and when modules are completed [12]. This is in line with Self



Determination Theory [13], which posits that autonomy is a central determinant of intrinsic motivation, which is linked to long-term behaviour change. It may be that when user control is high and therefore autonomy, motivation to engage with an intervention increases, reflecting better behaviour change outcomes thereafter. This may be particularly the case in certain population demographics, such as among men with prostate cancer, where perceptions of personal control can be threatened by a prostate cancer diagnosis [14]. Within the person-centred approach, qualitative investigation during the design process is also encouraged to allow a more comprehensive understanding of the end-user, and thus create a more relevant and engaging program [12]. In terms of prostate cancer and physical activity, previous qualitative investigations have reported on prostate cancer survivors' interest in [15-17], and challenges towards [15, 18-20] exercise participation. However, less is known about *how* prostate cancer survivors might like to receive online or computer-tailored behaviour change support.

In terms of online programs, most of the electronic and mobile health attention in prostate cancer has been on cancer treatment decision support programs [21-23]. Some previous physical activity computer-tailored studies have demonstrated the potential for prostate cancer survivors [24-26] in terms of feasibility, acceptability and efficacy in the prostate cancer population. However, the results of these studies had either unclear prostate cancer specific data due to amalgamated cancer data [24], had limited effects on those with prostate cancer (though was successful for colon cancer survivors) [25], or was only targeting a specific treatment subset of prostate cancer survivors (i.e. those on hormone therapy) [26]. Furthermore, like many online interventions, these studies, suffer from disengagement and drop out over time.

Broadly speaking, there is little literature exploring the perspectives of prostate cancer survivors for online programming and how this might impact engagement. For example, there is no literature exploring what form of computer-tailored program delivery system is preferred (i.e. standard tunnelled version, or a more autonomy supported program). These factors are important to consider during the intervention design process, as interventions that take user preferences into account report higher

engagement and adherence [9]. Given prostate cancer survivors' interest in physical activity programs, combined with the promise of computer-tailored interventions for delivering high quality and wide-reaching support, more research is needed to inform the development future computer-tailored online interventions. To inform this development, this study aimed to gain a greater understanding of prostate cancer survivors by exploring their perceptions of their cancer experience, as well as their opinion and preferences regarding physical activity and online intervention features.

## Methods

### *Study Design*

This study used semi-structured interviews to explore prostate cancer's experience with their health, physical activity and their use of technology and the Internet. This study follows the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines [27]. The University of Adelaide Human Research Ethics Committee (H101-2017) granted ethical clearance.

### *Participant Selection*

Men were required to be over the age of 18, diagnosed with localised or locally advanced prostate cancer, in remission, and have completed active treatment (e.g. surgery, or radiotherapy). Those currently on hormone therapy were still eligible, however those who had metastatic disease or who were on active surveillance were not eligible to participate. This decision was made based on the intended scope of the study. Men had to be able to read and write fluently in English. For the recruitment flow chart, see Figure 1. Recruitment was conducted predominantly within South Australia. Flyers were placed in local council newsletters, doctors' waiting rooms. Social media posts, used of a men's health research register, community presentations, men at two support groups, and local urologists were also utilised for recruitment.

### *Setting*

Given the good quality of data of phone interviews compared to face-to-face interviewing [30], both options were offered to participants. The face-to-face interviews were conducted in a consulting room containing two chairs, a table, and a recording device, based at the South Australian Health and Medical Research Institute.

### *Facilitator Characteristics*

A Caucasian female PhD student (AF) with previous experience in medical telephone interviews and undergraduate studies in public health and psychological sciences led the study and conducted the interviews. The relationship between parties was established by email communication or through face-to-face recruitment efforts. All participants were informed that the study was part of a PhD program, and that the findings would be used to guide the development of a future online intervention.

### *Procedure*

All interested participants were provided with a copy of the information sheet and consent form and instructed to contact the researcher (AF) for eligibility screening and to book an interview time if they were eligible for the study. Field notes were written by the interviewer on a printed guide sheet and stored in a locked cabinet only accessible to the interviewer. The interview lasted approximately half an hour, and participants also completed a small demographical questionnaire. The participants received a \$25 gift card as compensation. Interviewing continued until data saturation had occurred, where no new codes, themes or data were identified from each additional interview [28].

### *Theoretical Approach*

The data was analysed using thematic analysis [29], underpinned by a realist / experiential assumption [29]. That is, the interpretation of the data is truly what the interviewees experienced, with little interference placed by the researcher during data analysis [29].

### *Data Collection*

The semi-structured interview schedule was developed, and pilot tested by AF in consultation with CES (see [https://figshare.com/articles/Interview\\_guide/6395801/1](https://figshare.com/articles/Interview_guide/6395801/1)). The interview was segmented into three topics. This included 1) men's experience with prostate cancer, 2) their perceptions on physical activity, and 3) questions about Internet use and online programming preferences. Briefly, the interviewer asked questions about the participants' prostate cancer diagnosis and treatment; their attitudes, barriers and facilitators, current and past physical activity behaviour; their use and perceptions of the Internet and technology, current usage patterns; and preferred features of websites. Participants were then asked about the pros and cons of the two delivery systems of a computer-tailored program (tunnelled *or* free choice) and which version they could envision themselves preferring. Participants were also asked whether an online program that 8-12 weeks in duration was would be appropriate, as this is a relatively standard intervention length [31].

### *Data Analysis*

All interviews were audio recorded and transcribed verbatim. The transcripts were read in detail by a single researcher (AF). Following thematic analysis outlined by Braun and Clark [29], a single researcher (AF) identified codes by hand on print outs of the transcripts. This was inductive in nature. The codes were then transferred into tables on Microsoft Word and then placed into themes. Any overlapping data or un-coded data was re-analysed to ensure all relevant information had been considered and included for

analysis. A second researcher (CES) then separately read through three transcripts, blind to the codes generated by AF. Both researchers compared transcripts to assess the codes and themes and reach consensus on the overarching themes. Based on this process, the data was continually revised and refined for each theme until all researchers were satisfied that the themes and subthemes were thoroughly explored. Pseudonyms names were generated and allocated to each participant in order to protect their identity.

## Results

*Participants:* A total of 16 participants completed the study (see Figure 1). Participants were primarily from two cancer-support groups (N=12). Additionally, four participants were recruited each from the University of Adelaide's men's health register, a community event, and snowballing techniques respectively (see Figure 1). The participants averaged 71.1 years of age ( $\pm 7.1$  years.), and 5.1 years ( $\pm 4.6$  years) since treatment. Surgery (N=6), and a combination of treatments (N=5) were the most commonly reported treatment pathways (see Table 1). Nine men were from a metropolitan location, and seven men were from regional (N=6) or rural (N=1) locations.

Insert Table 1

*Summary of Themes:* The results correspond to each of the three topics covered in the interview, each with their associated themes and subthemes. Themes for topic one (men's experience with prostate cancer) were *pre-treatment* and *from treatment onwards*. Topic two (physical activity) contained two main themes, which were *physical activity behaviour* and *physical activity determinants*. Topic three (the Internet)

contained three themes including *use of the Internet, preferences for website features* and *preferences for an online physical activity program*. For more of the participant illustrative quotes please refer to Supplementary Tables 1, 2 and 3.

## Topic 1

Men's experiences with prostate cancer data eluded to pre-treatment and from treatment onwards. For more participant experiences see Supplementary Table 1.

Pre-treatment: Three sub-themes were identified which included men's *expectation to get a diagnosis, being diagnosed* and *treatment choices*.

*Expectation*: Several participants described that the diagnosis "... comes out of the blue" (Brian, 74yrs). Though a couple of men who had family experience (i.e. brother/father) were less surprised when they received their diagnosis, (see Table 3). For example, "So my father got prostate cancer, he was much older than me when I got it. So we sort of had blood test but I hadn't had one for two years and I had to go to the doctor for inoculations for going overseas." (Maurice, 56yrs)

*Being Diagnosed*: All participants described their experience with being diagnosed with prostate cancer, with considerable focus on the prostate specific antigen (PSA) blood tests. "... well if its [PSA] starting to go up now I want further investigation myself" (Fred, 74yrs).

*Treatment Choices*: Participants recounted if they had choice in their cancer treatment decision. All participants chose an active treatment approach. For example, one participant wanted active treatment for fear of the cancer spreading, and another participant's doctor recommended watchful waiting, but the participant wanted the cancer to be taken out if possible. Many participants were told that "you've got choices" (Tim, 75yrs) in terms of cancer treatments options. However, several men were not able

to have the treatment they initially wanted due to age or medical recommendations. There was a sense that men wanted to get rid of their cancer.

*“What I wanted to was get rid of it of course, just get rid of it and he said no no no, not at your age he said I wouldn’t contemplate that, it would be better he said if you had radiation treatment” (Bill, 83yrs)*

*“It’s not the upper end of it. It’s not that severe. You’ve got choices. Do you want to keep on monitoring it and live with it or do you want to do something about it, and he said the only thing to consider is that if you do continue monitoring it and it breaks out, it will go to your spine. And when it gets to the spine, I’ve heard of all that- doesn’t sound a very pleasant way to die. No, so I said let’s be proactive and let’s remove it and at that time he explained all the health implications and the sexual implications, whatever. (Tim, 62yrs)*

From Treatment Onwards: This theme encompasses many common side effects as described by the participants. This theme contained two sub themes that were *physical side effects* and *psychological side effects*.

*Physical side effects:* Almost half of participants mentioned urinary incontinence post treatment.

*“Yeah. But I—I think, uh, in the early days that was the biggest impediment, uh, for any sort of um, freedom of movement... For a while me and the toilet were best friends” (George, 75yrs)*

A couple of participants had blood in their faecal stools from radiation treatment, for example “... was really in dire strait. Blood was coming out both ends of my passages. I was really crook for a while.” (Graham, 78yrs). Four participants specifically mentioned ongoing impotence from surgery, while other participants reported weight gain from hormone treatment.

*“...um, mmm, several years ago I started to develop er, a erectile dysfunction, which ahs gotten worse and I had my prostate out and therefore, I’m er, rather inhibited goes as far as sexual activity goes... (Harry, 75yrs)*

*Psychological side effects:* The participants predominantly talked about how their lives and their relationship with life values had changed. “I guess you sorta make the most of things and live every day” (Gordon, 78yrs). There was the potential that low levels of prostate specific antigen (PSA) levels, which are a blood marker for prostate cancer, were linked to wellbeing, for example - “You know if the psa- see what I’ve learnt today is if the psa moves there’s a reason (Ronald, 65yrs). Some men expressed issues with reduced sexual performance though this was not further probed in the interview.

*“People ask me do you regret having it done- I say in one way I do because my sexual performance is dramatically different” (Tim, 62yrs, metro, technical school, 6 months post, localised disease)*

## Topic 2

This physical activity section has two main themes which were physical activity behaviour and physical activity determinates. For more participant experiences see Supplementary Table 2.

Physical Activity Behaviour: The physical activity theme contained two sub themes coded as *past behaviour* and *current behaviour*.

*Past behaviour:* Six men described how they were active when they were younger. Men who had positive experiences of physical activity in the past appeared to maintain their enthusiasm for physical activity unless they had ongoing injuries. For example,



“...I’ve been exercising since I was 15, I’m now 56.” (Maurice, 56yrs). In contrast, several participants who exercised in their youth could no longer participate due to “age and arthritis- it sort of starts to limit what I can: “severe arthritis” (Graham, 78yrs).

*Current physical activity behaviour:* Participants activity ranged from “not a lot” (Charles, 71yrs) to “every morning,” (Fred, 74yrs). The most common activity was walking, however activity around the home, garden, and work-based activities were also commonly discussed. In addition to walking, participation in competitive sport (soccer/football and lawn bowls), cycling (road and off road), and two or swimming was also reported by participants.

*“.... Every morning, every morning, approximately every hour or half and hour to an hour” (Fred, 74yrs)*

*“I’ve been playing bowls for 45 years – I like the competition. Especially pennant bowls, I like pennant bowls” (Peter, 76yrs)*

*“My wife and I use it [swimming pool] pretty much every day ...” (Gordon, 78yrs)*

Most men were not undertaking resistance training when probed. Very few men were regularly undertaking resistance training (one younger participant, one on hormone treatment). Though one participant also on hormone treatment said he occasionally used weights at a gym.

Physical Activity Determinants: The sub themes associated the determinants of physical activity included *information seeking and knowledge, perceptions and attitudes, facilitators and barriers.*

*Information Seeking and Knowledge:* Participants identified that their physical activity advice and knowledge was sought from mixed sources. Three men described using the Internet or listening to the radio to search for exercise advice. For example, participant said, “I’m resourceful enough- I read a lot and yeah- listen to people who speak on the radio and so on, I keep abreast of things” (Brian, 74yrs). Other participants

relied on their partners or information from trusted health professionals. For example, one participant said, “I rely on what my physio tells me”

*“See I’ve done little research for myself but my wife has- she’s been involved in a lot of reading- she was in nursing herself so- you know- so she’s always done a lot of research...So and the exercise. I don’t know where I picked it up from. I think my wife has done a lot of research that exercise is an important key factor.... No, no that’s something we’ve learnt ourselves- from watching TV or whatever...” (Ronald, 65yrs)*

No participants knew of the oncology guidelines for physical activity, and interest in the guidelines when probed at interview was limited. For example, one participant stated, “No, I have no idea- I don’t pay attention to them” (Maurice, 56yrs).

*Perceptions and Attitudes:* Among those with positive associations, physical activity was described as important, or as something one should do. Ten of the participants had positive responses to physical activity. These participants tended to have higher education levels and were all physically active when they were younger. The remaining six participants either felt that they had difficulty doing physical activity, found physical activity boring, or feeling like they do not need it because they perceive “ I don’t need it...I have enough” (Mark, 73 yrs.) or that, “... for age and mileage, I think I’m getting reasonable physical activity” (Brian, 74 yrs.).

*Facilitators:* Facilitator data was coded as ‘social support’, ‘motivational and habit formation’, and ‘access to physical activity opportunities’. For some participants, social support might have involved participation in a prostate cancer gym or support group, walking with a partner, or having access to a professional. One participant had stopped walking at the time of the interview as his wife (inferred facilitator) had an injury (see Supplementary Table 2). In terms of specifically mentioned motivator; one participant also mentioned that he liked his wrist worn wearable tracker as a way to increase self-motivation. A few participants mentioned perceived general self-motivation, as well as the use of routine, and habit formation as facilitators of physical activity.

“Well we are sort of in a routine now. That simplifies it and we psychologically adjust to it. We can cope with that” (Brian, 74yrs).

Three participants noted that access to home-based equipment, and proximal swimming facilities were facilitators and made it easier to be active. For example, one participant mentioned, “the access is easier, it takes me two minutes to walk to the pool and it is available eighteen hours a day...” (Peter, 76yrs).

*Barriers:* There were a variety of issues that inhibited participation in physical activity. Participants who were still working found that ‘finding time’ was a considerable barrier. All but one (who was younger) participant mentioned some form of health-related co-morbidity, including combinations of musculoskeletal pain, arthritis, incontinence, cardiac, and respiratory issues. Comorbidities also included treatment related side effects as something that currently impacted them.

*“Um, as time goes on I, I get older- I get tired more easily...Um, physical activity is of any sort becomes harder as I get older.” (Harry, 75yrs, metro, year 11, 4 months post, localised)*

*“Yeah. But I—I think, uh, in the early days that was the biggest impediment, uh, for any sort of um, freedom of movement- Um, was the worry about toilet [after radiation]...Oh heart and lungs I guess, that would be two that come to mind straight away. I had a heart attack a few years ago and my heart was damaged- its not working as well as it used to. Um, er also have a problem with my lungs, er, probably fibrosis” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)*

*“I have some back problems and I can’t walk more than a couple of hundred meters without having to stop (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)*

*“...but are you dribbling as well [from treatment], because older men leak as women do and it get’s embarrassing. And I think these things stop people from exercising” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)*

For two regional participants, distance to get to a gym was seen as an issue, as was also the financial burden for one participant on a pension. For example, one participant said, “There is a barrier in that we are two, three km out of town. So, you’ve actually got to get in the car and make an effort” (Mark, 73yrs). These interviews were conducted during winter and predominately with participants living in the southern part of Australia. As such, poor weather was a considerable barrier. For example, one participant said “[barriers?] Motivation, gale force winds- seriously it’s the weather that affects my ability- Bitterly cold and freezing season.” (Maurice, 56yrs). The only participant located in a tropical climate found it equally frustrating to exercise when it is ‘hot and humid’ (Charles, 71yrs).

### Topic 3: Internet Use and Programming Preferences:

This topic contains three main themes including the Internet, preferences for website features, and preferences for an online physical activity program.

The Internet: This theme contained two subthemes which included Internet *use* and Internet *access* as described by the participants.

*Use:* Most participants used the Internet regularly, often from a smart phone and/or home computer. No participant mentioned using handheld touch tablets, however this was not explicitly probed during the interview. Almost every metropolitan based participant used the Internet, often daily, whereas regional participants tended to use it less often. Overall, the Internet was mostly used for communication (email, social media, tourism research, or video calls), and for information searching.

*“...Obviously email. Private and personal, at work constantly... I use it a lot for, um, I s’pose research- looking into stuff- inquiring, news, um, I use it a bit for catch up TV” (Charles, 71yrs).*

*“But er I check it each day” (Harry, 75yrs, metro, year 11, 4 months post, localised disease)*

*“Yes. I use it a lot... Concurrent with all that [radiation treatment], I spent my life then on the internet” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)*

*“No I’m completely illiterate- I haven’t even got a computer or anything” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)*

*Access:* Participant’s access to the Internet and technology was an issue noted by three regional participants. Though, two regional participants who did not have a home computer said that they had to learn to use a smart phone instead due to their occupation (magazine delivery, and smart phone related farming apps). One participant mentioned accessibility issues, including “a lot of people haven’t got access” (Raymond, 61yrs) Another participant said “There should be more free [computer literacy] courses, there are some here in [place name] but you can’t always getting (sic) to them when they are on.” (Brian, 74yrs)

*Preferences for Website Features:* This theme explored preferred participant website features. This theme has the sub themes of *simplicity* and *quality information*.

*Simplicity:* Many participants commented that the most important feature of a website was simplicity. For example, one participant said that a website should be delivered “as simply as possible- I hate all the bells and whistles” (Charles, 71yrs).

*Quality of Information:* Overall, participants desired quality information that was concise, simple and easy to read for an online intervention. For example, one participant said, “I don’t want it too full of unnecessary information, I want to be able to find what I want.” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased) Another

participant said, “I think it’s more important to have up to date information and accurate information” (William, 71). One issue brought up was the design of the website, for example one participant noted, “The biggest fear for me would be the program designer. If it’s slightly frustrating to use, the compliance is minimal” (Maurice, 56yrs). Several participants liked the idea of video tutorials as important for delivery of information, for example one participant wanted to see exercise demonstrations.

Preferences for an Online Physical Activity Program: This theme had two subthemes included *website architecture* and *program length*.

*Website architecture:* There was mixed feedback regarding participant’s website architecture preferences for a hypothetical online computer-tailored program (see Table 4). The majority of prostate cancer survivors in this study said “Oh free choice for sure” (William, 71yrs). However, a couple of men who liked the idea of a free choice intervention did mention that a potential issue could be that a hypothetical participant might miss key information. The remaining participants were unsure as to what version would be better, or they wanted a program that was “a logical layout with steps” (Fred, 74yrs). Most men who cited preference for a free set up had a high level of education, whereas those who stated a preference for a step-by-step program had either not finished high school or went to some form of technical school.

*Length:* Many participants felt that the idea of an online program between 8-12 weeks was too long and “a bit of an imposition”.

*“You wouldn’t want it any longer than that [8 weeks]. It depends on how active the program is...6 could be long enough if you are doing something different each time” (Mark, 73yrs).*

## Discussion

The prostate cancer survivors in this study valued physical activity, though their participation was hindered. The barriers identified in this study concur with previous literature [15, 20, 32, 33], with participants citing issues of motivation, finding time to exercise, weather, as well as pain and muscle injury, and treatment related incontinence. However, in contrast to other cancer research [34], participants in this study did not mention cancer related fatigue as most of this study's participants were over five years post treatment, and cancer related fatigue can reduce overtime [35]. Other than treatment related incontinence, most of the barriers reported could be considered age related issues [36]. As such, future computer-tailored interventions could provide physical activity feedback that accounts for time since treatment, ongoing cancer treatment issues and including approaches to healthy aging.

Similar to previous findings, [3, 37], most participants in this study were receptive to the idea of an online physical activity program. The majority of participants used the Internet daily via smart phone and/or by home computer. However, those in non-metropolitan areas reported greater technology, infrastructure and accessibility challenges, which are known issues in regional settings [38]. Interestingly, two regional participants who did not have a home computer did have access to a smartphone with Internet capability. Using smart phone based apps, or mobile friendly websites [39], could be a potential option to improve access to programs if a home computer is not available. Similar to previous findings, in terms of website feature preference simplicity in both design and content [12, 40], as well as physical activity based tutorial videos [6, 12, 41] should be considered. While most behaviour change interventions targeting prostate cancer survivors are usually delivered over a 2-4 month period [42], the men in this study found this proposed length too much of an "imposition". However, reasons for this were not specifically explored within this interview. It might be that men's perceptions of an online program are fundamentally different to those of face-to-face programs, or that the expectations of an online program are impacted by previous exposure to online static websites. However, while participants might prefer the idea of a shorter program, more research is needed to identify a balance between user

preference and the ideal length required to effect meaningful behaviour changes. Furthermore, research is needed to explore differences in programming needs, perhaps looking into hybrid or adaptable tailored programs that allow face to face support if required. This could then impact the manner in which participant lifestyle goals are created. For example, depending on a person's preferences, physical activity goals could be adaptive in nature so that they respond to the persons needs if they change over time.

Program designers might also need to think about how they pitch the oncology guidelines or the recommended “dose” of physical activity to future participants. Previous cancer tailored interventions have provided feedback to users comparing their current and previous physical activity behaviour to the guidelines [43, 44]. However, this might not always be the most motivating or relevant method to inform participants. In this study, no participant knew of the oncological physical activity guidelines, nor had much interest in them. This could mean that the oncology exercise guidelines are either not are not considered relevant or getting through to the target demographic. It is therefore unlikely that programs that focused on pushing users towards the guidelines, without providing specific and relevant education, will encourage behaviour change [45, 46]. Ensuring future computer-tailored programmes provide flexible and person centred program is key [12]. This strategy may offer more engagement with the program, similar to those of wearable trackers [47, 48].

In terms of preferences for what form of website architecture prostate cancer survivors might prefer, the results were mixed. Some men in this study preferred the idea of traditional tunnelled module-based programs, which can be efficacious [4]. Whereas, other men in this study expressed a desire to be more in control, that is, to have more autonomy within a hypothetical computer-tailored health intervention. Autonomy is at the core of mobile app technology [47], yet in website based programs, autonomy and choice in Internet programs seems to have had less attention in the literature [12]. To encourage a person centred approach within digital interventions [12], future computer-tailored programs may look to encourage and promote more autonomy within their web-based interventions. For example, promoting the capacity to



‘self tailor’ the personalised content by allowing users to choose the order in which they complete modules or health based information could be an option [26], which has previously been utilised in a men’s health weight loss intervention [49]. However, previous literature lacks measures looking at engagement and behaviour change, not merely health outcome based data. Furthermore, there has been a lack of experimentation in the online tailored intervention field [50], and more research is needed to apply this to support prostate cancer survivors, given the lack of online attention to prostate cancer and behaviour change programs [51].

### *Strengths and Limitations*

This study was strengthened by reached data saturation and was able to represent men in both regional and metropolitan locations. A limitation of this study was that participants were not provided with transcripts for checking. The data is not generalisable to the wider prostate cancer survivor population as the participants in this study were older, further from their treatment, and their ethnic background was unknown. The methodology was strengthened by having two researchers to refine the themes, as well as application of the ‘realist / experiential’ assumption during the data analysis.

### **Conclusion**

Prostate cancer survivors valued physical activity after their cancer experience, though their capacity to be active tends to be limited by barriers including motivation, access and the presence of comorbidities. Taken together, the data suggests that online computer programming is suitable for prostate cancer survivors to receive physical activity support. Future programs should be aware of preferences for a concise, short and simple program that offers flexibility in how the participant engages with the program

Table 1: Participant Characteristics

<b>Characteristic</b>	<b>Total (N=16)</b>
Age (years)	M71.7 (SD5.1)
Time since last treatment in (years)	M5.1 (SD4.6)
Post high school education (N/16)	9/16
Treatment (N/16)	
<i>Surgery</i>	6/16
<i>Surgery + Radiation</i>	1/16
<i>Surgery + Hormone</i>	1/16
<i>Radiation</i>	4/16
<i>Radiation + Hormone</i>	2/16
<i>Hormone</i>	2/16
Single item: Global Health Status: Quality of Life QLQ-C	
30	2/16
<i>Excellent</i>	5/16
<i>Very Good</i>	8/16
<i>Good</i>	1/16
<i>Fair</i>	0/16
<i>Poor</i>	

Table 2: Summary of Themes

Topic	Theme	Sub Themes
Topic 1: Men's Experience with Prostate cancer	<u>Pre-treatment</u>	Expectation to get a diagnosis
		Being diagnosed
		Treatment choices
	<u>From treatment onwards</u>	Physical side effects
		Psychological side effects
Topic 2: Physical Activity	<u>Physical activity behaviour</u>	Past behaviour
		Current behaviour
	<u>Physical activity determinants</u>	Information seeking and knowledge
		Perceptions and attitudes
		Facilitators
		Barriers
Topic 3: The Internet and programming preferences	<u>The Internet</u>	Use
		Access
	<u>Preferences for website features</u>	Simplicity
		Quality information
	<u>Preferences for an online physical activity program</u>	Length
		Website architecture

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Supplementary Table1: Topic One - Men's Experience with Prostate Cancer Themes, Subthemes and Illustrative Quotes

<u>Theme: Pre-Treatment</u>	
Subtheme: Expectation to get a diagnosis	<p>“Well, of course the diagnosis comes out of the blue.” (Brian, 74yrs, rural, tech school, 60months post, localised disease)</p> <p>“And I said “ But I still don’t have any pain or problems or anything.” And he said “Well no, but you’ve got cancer and its running riot.” (Charles, 71yrs, metro, bch degree, 120 months post, local disease)</p> <p>“And because he’d [cousin] done a bit of reading, he was aware of how it followed through the male line. His father, my father were brothers. So he [my cousin] said “It would be prudent for you to get an examination-- a test.” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“So my father got prostate cancer, he was much older than me when I got it. So we sort of had blood test but I hadn’t had one for two years and I had to go to the doctor for inoculations for going overseas.” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p>
Subtheme: Being diagnosed	<p>“... well if its [PSA] starting to go up now I want further investigation myself” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“And in my case it came on very quickly because I’d been having periodical PSA tests which was nothing to be alarmed about, and then I had a check in April in one year and then we went away on a 6 week camping trip, came back and had another check three months after the first and the reading had jumped 3 points in 3 months” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“my psa had been gradually increasing, and it got to the stage where it got into double figures” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“So I said “ok”- So I went off and he did the biopsy, and that was an interesting experience...when you’re first told when you’ve got cancer is isn’t very nice... I was sort of reassured that if I was going to get cancer it was probably quiet a good one to have- its better than some to have” (Charles, 71yrs, metro, bch degree, 120 months post,</p>

	<p>local disease)</p> <p>“Then I’d had two biopsies” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced disease)</p> <p>“ I should clarify that my experience with prostate cancer is relatively limited. The diagnosis process was a little unusual and took several months, but once my status was confirmed I started with hormone treatment only, and am just completing six months down this path.” (Don, 66yrs, metro, bch degree, 6 months post, local advanced)</p> <p>“ I did indeed have prostate cancer but it wasn’t terribly bad” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p>
Subtheme: Treatment choices	<p>“ It’s not the upper end of it. It’s not that severe. You’ve got choices. Do you want to keep on monitoring it and live with it or do you want to do something about it, and he said the only thing to consider is that if you do continue monitoring it and it breaks out, it will go to your spine. And when it gets to the spine, I’ve heard of all that- doesn’t sound a very pleasant way to die. No, so I said let’s be proactive and let’s remove it and at that time he explained all the health implications and the sexual implications, whatever. (Tim, 62yrs, metro, technical school, 6 months post, localised disease)</p> <p>“The first one of watch and wait, I said forget that, and I said if you can do the radical check, take it out” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“ I elected to take a radiation therapy primarily because it was 3D conforming...And it—oh! The other thing is I, I was fearsome of side effects [of surgery]... I, I had read about uh, people becoming incontinent and impotent" (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“What I wanted to was get rid of it of course, just get rid of it and he said no no no, not at your age he said I wouldn’t contemplate that, it would be better he said if you had radiation treatment” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p>
<u>Theme: From Treatment Onward</u>	
Subtheme:	<p>“ And the answer is, he [doctor] was quite right. So I decide that um, that sticking myself with a needle really</p>

Physical side effects	<p>wasn't worth it [for erections], um, so I haven't bothered since." (Charles, 71yrs, metro, bch degree, 120 months post, local disease)</p> <p>"<i>pause</i>, um, mmm, several years ago I started to develop er, a erectile dysfunction, which ahs gotten worse and I had my prostate out and therefore, I'm er, rather inhibited goes as far as sexual activity goes... (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p> <p>"Yeah. But I—I think, uhhh, in the early days that was the biggest impediment, uhhh, for any sort of um, freedom of movement... For a while me and the toilet were best friends" (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>"I got through the radiation – I was really in dire strait. Blood was coming out both ends of my passages. I was really crook for a while." (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>"I had a radical prostatectomy in November 2007 and since then I've had three subsequent operations or procedures to correct my incontinence problem...I've gained weight because I have not been able to exercise as much as I used to. I used to ride the bike a lot and because of the sphincter that has been fitted and everything... I cannot sit on a bike saddle any more" (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>"I got through the radiation – I was really in dire strait. Blood was coming out both ends of my passages. I was really crook for a while." (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>"I could go to the toilet and sit there and listen to blood coming out of my rectum. That's how bad it was. Not good at all. I had to wear pads and all that type of stuff all the time. Anyway he got it to a stage where I was only bleeding 2 or 3 times a week." (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>"People ask me do you regret having it done- I say in one way I do because my sexual performance is dramatically different"(Tim, 62yrs, metro, technical school, 6 months post, localised disease)</p> <p>"And the answer is, he [doctor] was quite right. So I decide that um, that sticking myself with a needle really</p>
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	<p>wasn't worth it, um, so I haven't bothered since." (Charles, 71yrs, metro, bch degree, 120 months post, local disease)</p> <p>" You get muscle, uh, wastage. And you put on, uh, weight. That fear of putting on weight—I had this fear of men's boobs. And I was really mortified at the notion that would happen" (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>"The hormones have given me a little bit of weight gain, like 20 kilos and enlarged breasts" (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>"... cos you know with the hormone treatment, you put weight on, muscle wasting- what else, lots of symptoms. And as you know, I suppose you know, that that the best therapy for this - keep active." (Ronald, 65yrs, metro, year 10, 10 months post, local advanced disease)</p>
Subtheme: Physical side effects	
	<p>" And the answer is, he [doctor] was quite right. So I decide that um, that sticking myself with a needle really wasn't worth it [for erections], um, so I haven't bothered since," (Charles, 71yrs, metro, bch degree, 120months post, local disease)</p> <p>"<i>pause</i>, um, mmm, several years ago I started to develop er, a erectile dysfunction, which ahs gotten worse and I had my prostate out and therefore, I'm er, rather inhibited goes as far as sexual activity goes... (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>"Yeah. But I—I think, uh, in the early days that was the biggest impediment, uh, for any sort of um, freedom of movement... For a while me and the toilet were best friends" (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p> <p>" I got through the radiation – I was really in dire strait. Blood was coming out both ends of my passages. I was really crook for a while." (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>"I had a radical prostatectomy in November 2007 and since then I've had three subsequent operations or</p>

	<p>procedures to correct my incontinence problem...I've gained weight because I have not been able to exercise as much as I used to. I used to ride the bike a lot and because of the sphincter that has been fitted and everything... I cannot sit on a bike saddle any more" (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>"I got through the radiation – I was really in dire strait. Blood was coming out both ends of my passages. I was really crook for a while." (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>"I could go to the toilet and sit there and listen to blood coming out of my rectum. That's how bad it was. Not good at all. I had to wear pads and all that type of stuff all the time. Anyway he got it to a stage where I was only bleeding 2 or 3 times a week." (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>"People ask me do you regret having it done- I say in one way I do because my sexual performance is dramatically different"(Tim, 62yrs, metro, technical school, 6 months post, localised disease)</p> <p>" And the answer is, he [doctor] was quite right. So I decide that um, that sticking myself with a needle really wasn't worth it, um, so I haven't bothered since." (Charles, 71yrs, metro, bch degree, 120months post, local disease)</p> <p>" You get muscle, uh, wastage. And you put on, uh, weight. That fear of putting on weight—I had this fear of men's boobs. And I was really mortified at the notion that would happen" (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>"The hormones have given me a little bit of weight gain, like 20 kilos and enlarged breasts" (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>"... cos you know with the hormone treatment, you put weight on, muscle wasting- what else, lots of symptoms. And as you know, I suppose you know, that that the best therapy for this - keep active." (Ronald, 65yrs, metro, year 10, 10 months post, local advanced disease)</p>
Subtheme: Psychological side effects	<p>" Fortunately with periodic checks, Ive just got my most recent one. It was 0.03. Dr Tran, she said they class that as undetectable. It's as low as they can read. So she said I've had a good result. The things is hopefully it stays that way. But of course you never know. You keep checking...My views have changed because before I used to worry</p>

	<p>about not getting something done, now ah so what, tomorrow will come.” (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>“ And the urologist after subsequent checks said right, I’m in the clear. I don’t need to see you unless you think I should see you. Which is the best possible thing.” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“ Whether it will come back we’ll never know I s’pose but I’m happy at the moment. My psa’s down, I feel ok.” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“You know if the psa- see what I’ve learnt today is if the psa moves there’s a reason (Ronald, 65yrs, metro, year 10, 10 months post, local advanced disease)</p> <p>“... well if its starting to go up now I want further investigation myself” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“I’m a different person now. I have a different outlook on life. I live each day as it comes, I don’t plan too far ahead...” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“I guess- one of the things I feel is that um, been there, done that beaten it...which kinda give me a slightly different outlook on life” (Charles, 71yrs, metro, bch degree, 120months post, local disease)</p> <p>“I guess you sorta make the most of things and live every day” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“I view my mortality quite differently” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“I always look at things in a positive way instead of a negative way” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced) “ And we’ve gotten to the stage of er, what would you say, potato couch...I got a bit of a wake up after the diagnosis” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“Exercise has been important...So we changed our diet in the belief that this might be helpful, uhhh, and uh, later</p>
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	<p>when I was on the uh Cancer Australia, uh-hm, Research Review Committee, came across a submission from Western Australia about exercise... and depression and uh-hm, and the extent to which it benefitted men with prostate cancer. Since that time I have instituted an exercise program for myself.” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“Like men who have just found out that they have prostate cancer, and it's incurable, 'older adults' have probably come to a similar view of their own mortality and are keen to improve the quality of the years ahead, even add some more years or reliability to that possible total.” (Don, 66yrs, metro, bch degree, 6 months post, local advanced)</p> <p>“Not really different [to lifestyle changes]” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>“And er, and its my way of keeping fit cos you know with the hormone treatment, you put weight on, muscle wasting- what else, lots of symptoms. And as you know, I suppose you know, that that the best therapy for this - keep active.” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced disease)</p>
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Supplementary Table 2: Topic Two – Physical activity themes, subthemes and illustrative quotes

<u>Theme: Physical Activity Behavior</u>	
<i>Subtheme: Past behaviour</i>	<p>“Oh used to, yes. I used to. Played rugby, I used to play table tennis; I played that for donkey’s years at quite a high level so I was pretty active.” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“ When I was a young man in the army. Lots of aerobic classes. Do the circuit class. I used to enjoy that... I’ve been exercising since I was 15, I’m now 56.” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“Er no, I work a lot.” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“I was never into sport... I’m not interested in it...I can tell you with a certain amount of perverse pride I have never in my life attended a football match” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>“Well I use to exercise a lot. When I was living in [town name] on [name of road] which is just a stone’s throw from the beach, and I use to go for long walks, and we had a little Maltese Shitzu and we use to take her for a walk. I use to do a little physical exercise at home, push ups and stuff like that, but with age and arthritis it sort of starts to limit what I can do now.” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p>
<i>Subtheme: Current behaviour</i>	<p>“Every morning, every morning, approximately every hour or half and hour to an hour” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“Um, not a lot- no.” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>“The other day I walked for about 8k. So I walk one day [a week]...” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p> <p>“My wife and I use it [swimming pool] pretty much every day ...” (Gordon, 78yrs, metro, bch degree, 10</p>

	<p>months post, local advanced)</p> <p>“In actual fact I’ve started a more healthier program, so I’m walking every morning” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“Um, well I do a lot of walking... I do physical activity- like this week I had a hard week- doing gardening, shopping, pruning- whatever. I worked like a dog for 3 days so you know, you know. Nothing- nothing seems to be too greater effort. I just get in there and do it.” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced)</p> <p>“Which I do, so I walk most of that route [paper delivery run]. I would be doing 5 or 6 kms in an hour and a quarter” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“I mean I’m active around the house, I walk about the house and the garden. I walk as much as I can. And then stop when I have too” (Graham, 78yrs, regional, year 9, 84 months post, localised disease)</p> <p>“The other day I walked for about 8k. So I walk one day [a week]...” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“.... Every morning, every morning, approximately every hour or half and hour to an hour” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“Um, oh yes I think tis a good thing, you should keep, keep exercising as much as you can. Um, well not as much as you can perhaps but at least you try to fit in activity every day. And, um, I’m not able to walk as far as I used to- I have some back problems and I can’t walk more than a couple for hundred metres without having to stop. I get a bit breathless but I try and exercise as much as I can. We’ve got a swimming pool in the village I live in- I live in a lifestyle village, we have an indoor swimming pool. My wife and I use it pretty much every day. It’s a very nice warm pool. That we find that if we get down their first thing in the morning, I’m talking about 8 o clock in the morning. Have breakfast and then go down there. ‘Slong as you’re not going out some where that means leaving home, well we can go in there and I swim a bit and do a bit of aqua aerobics and then we sit in the nice hot spa for a while and loosens the body up and gets you off to a good start...” (Gordon, 78yrs, metro, bch</p>
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	<p>degree, 10 months post, locally advanced disease)</p> <p>“I do some aerobic exercises as well as swimming I do laps of the pool...” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“I’ve been playing bowls for 45 years – I like the competition. Especially pennant bowls, I like pennant bowls” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“I’ve been exercising since I was 15, Im now 56. I still play competition sport (soccer).” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>" . I er, I’m very active, I gave up golf because I took up bike riding, course when you take up bike riding ...So I’ve been riding now a push bike for nearly 10 years...And er, and its my my way of keeping fit cos you know with the hormone treatment, you put weight on, muscle wasting- what else, lots of symptoms. And as you know, I suppose you know, that that the the the best therapy for this - keep active. You have to walk. Bike riding, good food and so on and that’s what we’ve been doing.” (Ronald, 65 yrs, metro, year 10, 10 months post, local advanced disease)</p> <p>Resistance training</p> <p>“Oh God no” (Charles, 71yrs, metro, bch degree, 120months post, local disease)</p> <p>“My steps, I, I mean I er, since I retired there hasn’t been any time of course, but before I retired I used to have a bit of a go at the exercise machine and er, lift a few weights and things but er- I used to cycle regularly after I retired on a Tuesday ride, and er, cycling for pleasure etc, but I er, when I was diagnosed with prostate cancer and had the treatment they said you need to stay off the push bike for 6 months and then never really got back into bike riding- and the wind surfing has gone down a bit. I used to play badminton and table tennis, and I’m not doing them anymore. I, Ive got weights here but I just don’t- I’m not organised enough to devote time some to- so I only do the walking- that’s about all I do. I don’t—er, I do sometime try to walk sometimes</p>
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	<p>reasonably briskly but I don't eh, used any of the weights or the exercise machine these days." (William, 71yrs, metro, post graduate studies, 180months, localised disease)</p> <p>"No, I've er- my local doctor is actually going to sign me up with something in the next month..." (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p> <p>"[Resistance?] "No, there is no need to." (Brian, 74yrs, rural, tech school, 60 months post, local disease)</p> <p>"Not really, I used to do gym work pre operation but I do not do weights now. We have got a small gym here with some very good equipment, I should try it to see whether it does affect me or not but I am quite happy with the swimming at the moment." (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>"[Resistance?] Nah, I was a few years back. I went to the local gym, the girl gave me a whole lot of things to do, exercise. But I found was with my arthritis, Ive got a real bad shoulder, I'm very limited what I can do. I'm 78 and even going for a walk now is a bit of a huff and puff sort of thing." (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>"Uh, occasionally, we do have a gymnasium in here, I sometimes go in there and er not heavy weights, we've got a circuit where you've got pull downs and leg lifts and ere r yeah, I do that. I should do it a little bit more than I do, but I still do exercises in the pool which is the equivalent of weight lifting. I've got plastic things with ere r you can use to move through the water and that er is the equivalent" (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>"[Resistance?] Last night. I have a little weight bench that I have that I use for doing my physio. My physio gives me exercises. I have an elastic band but I do basic weights. I know my knees are playing up badly so I do a lot of strengthening of my muscles around there and do some upper body stuff – light stuff. We have a rowing machine that we bought but we never really use it. I find at my age its not the right sort of exercise. I do 24 hour shifts, 4 days on. You cant just duck off for a run." (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p>
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	<p>“[Resistance] And so ultimately I left and I’ve set up my garage. If, y’know, I now move the car out, I put a tarpaulin, I got rubber mats, I’ve got a ball, and I have some weight and uh, some stretch cords that I put on the door.” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p>
<p><u>Theme: Physical activity determinants</u></p>	
<p>Subtheme: Information seeking and knowledge</p>	<p>Information sources</p> <p>“I rely on what the <i>physio</i> tells me” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“Well the first place I go is straight to my GP” (Bill, 83yrs, year 9, 72 months post, localised disease)</p> <p>“ See I’ve done little research for myself but my wife has- she’s been involved in a lot of reading- she was in nursing herself so- you know- so she’s always done a lot of research...So and the exercise. I don’t know where I picked it up from. I think my wife has done a lot of research that exercise is an important key factor.... No, no that’s something we’ve learnt ourselves- from watching TV or whatever...”(Ronald, 65yrs, metro, year 10, 10 months post, local advanced)</p> <p>“Self managed, self thought out” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“Predominantly I use the internet for education” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“ I was confident enough- I’m resourceful enough- I read a lot and yeah- listen to people who speak on the radio and so on, I keep abreast of things” (Brian, 74yrs, rural, tech school, 60months post)</p> <p>“So we changed our diet in the belief that this might be helpful, and uh, later...came across a submission from Western Australia about exercise... and depression and um, and the extent to which it benefitted men with prostate cancer. Since that time I have instituted an exercise program for myself.” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p>

	<p>Oncology guidelines knowledge</p> <p>Wouldn't have a clue" (Fred, 74yrs, year 10, 96months post, localise disease)</p> <p>"No, I rely on what <i>physio name</i> tells me" (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>"Not really" (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>"No, I have no idea I don't pay attention to them" (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease) "No, my only general comment which is er, is that um, you know just generally speaking you try and keep yourself active... As physically fit as you can" (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p>
Subtheme: Perceptions and attitudes	
<i>Responses to the words 'physical activity'</i>	<p>"Let's go" (Fred, 74yrs, year 10, 96months post, localise disease)</p> <p>"Great, got to do it." (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>"My first reaction is...I am going to give it a go." (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>"Physical activity does not scare me." (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>"Um, oh yes I think tis a good thing, you should keep, keep exercising as much as you can. Um, well not as much as you can perhaps but at least you try to fit in activity every day" (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced)</p> <p>"Yes. Must do more" (Charles, 71yrs, metro, bch degree, 120months post, localised)</p>

	<p>“Um, physical activity is of any sort becomes harder as I get older.” (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p> <p>“Well I use to exercise a lot. When I was living in [town name] on [name of road] which is just a stone’s throw from the beach, and I use to go for long walks, and we had a little Maltese Shitzu and we use to take her for a walk. I use to do a little physical exercise at home, push ups and stuff like that, but with age and arthritis it sort of starts to limit what I can do now.” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>“[re group activity but cannot participate due to hernia] “We were thinking of having a cup of coffee together and then we started the [exercise] group and I miss it, I miss it badly... And also I would say, tell them [any future participants] only do what they can...if they can’t do the whole program.... do bits of the program when they can... You don’t have to do it altogether so that you can do more without hurting yourself” (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>“Didn’t play any sport...I find that stuff boring.” (Tim, 62yrs, metro, technical school, 6 months post, localised disease)</p> <p>“I don’t need it. I have enough. (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p>
<i>Occupation / incidental activity</i>	<p>“Used to go for walks. Occasionally just to sort of get out. I am up at the museum three days a week and I’m moving around all day there. I reckon I’m getting for age and mileage, I think I’m getting reasonable exercise.” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>“I don’t need it [physical activity]... I have enough...” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“I’ve always been a mover I have been, I come off a farm.. you are on the move all the time so there was no special activity to keep myself fit or anything like that because you are on your feet all the time and you’ve just gotta do what you gotta do” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p> <p>“I was doing earth moving which was fairly active and strenuous work.” (Fred, 74yrs, year 10, 96months post,</p>



	<p>localise disease).</p> <p>“Like yesterday. I’ve got a big shed, fifteen metres by nine metres. And I’ve got a loft in my shed. Up in my loft I keep all my camping stuff. SO going away now, I’ve just lifted all the stuff off the loft that’s got to come with me. Pitching tents and tarpaulins. Shade mat to walk on so you don’t stir the dust up, all those types of things. The gas barbeque, the gas oven, the gas stoves, burners.... I had to fill up all the gas bottles and then the jerry cans for the generator and the jerry cans for the vehicle fuel and all that type stuff so I just said to the Chiro – he said you’re shoulders are a bit out, and I said well I’ve been carrying jerry cans full of fuel. If I wasn’t doing that I’d be in the garden. I got 15 fruit trees on our block. So there is always weeding and pruning and all that kind of stuff. I don’t cut the lawn, a lawnmower man does that type of stuff.” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p>
Subtheme: Facilitators	
<i>Social support</i>	<p>“My wife and I used to walk every morning... but my wife has a crook leg at the moment... The weather and also my wife has a crook leg at the moment. I guess that’s more of an excuse than anything else. I could still do it....Not really. [social support]- Having someone like Physio’s name to work with you and say this is what you should be doing. That’s good whereas, I’ve never had that type of thing before. I’ve never had that type of assistance (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“Cause I’m usually, uh, a solitary worker; a private individual, and I was amazed at to the extent to which [support groups] that was helpful [to exercise].” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p>
<i>Motivation and habit formation</i>	<p>“Cos I’m suborn and pig headed I suppose... Well it [step counts] quantifies it, I mean I’ve tried to be active but you never really know unless, er, you log it all” (William, 71yrs, metro, post graduate studies, 180 months, localised disease)</p> <p>“I think I’m a strong minded ” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced) “Well we are sort of in a routine now. That simplifies it and we psychologically adjust to it. We can cope with that.” (Brian,</p>

	<p>74yrs, rural, tech school, 60 months post)</p> <p>“So I’m not a fitness freak or diet but I do believe in trying to be proactive with this stuff.” (Tim, 62yrs, metro, technical school, 6 months post, localised disease)</p>
<i>Access to physical activity opportunities</i>	<p>“I got rubber mats, I’ve got a ball, and I have some weight and uh, some stretch cords that I put on the door.” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p> <p>“I mean I’ve got bar belles and an exercise machine and exercise bike here at home but I don’t er, get around to using them.” (William, 71yrs, metro, post graduate studies, 180 months, localised disease)</p> <p>“ The access is easier, it takes me two minutes to walk to the pool and it is available eighteen hours a day...” (Peter, 76yrs, rural, year 11, 36 months post, localised disease).</p>
Subtheme: Barriers	
<i>Age</i>	<p>“I use to do a little physical exercise at home, push ups and stuff like that, but with age and arthritis it sort of starts to limit what I can do now” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>“Um, as time goes on I, I get older- I get tired more easily...Um, physical activity is of any sort becomes harder as I get older.” (Harry, 75yrs, metro, year 11, 4 months post, localised)</p> <p>“... but I’m a lot older now and a lot more sensible” (Charles, 71yrs, metro, bch degree, 120 months post, localised disease)</p>
<i>Co-morbidities:</i>	<p>Lungs and heart</p> <p>“ And I said I am out of breath. He said is that a fact and he grabbed me by the wrist and he said you’ve got an irregular heartbeat too.” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p> <p>“Yeah. But I—I think, uhhh, in the early days that was the biggest impediment, uhhh, for any sort of um,</p>

	<p>freedom of movement- Um, was the worry about toilet [after radiation]...Oh heart and lungs I guess, that would be two that come to mind straight away. I had a heart attack a few years ago and my heart was damaged- its not working as well as it used to. Um, er also have a problem with my lungs, er, probably fibrosis” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>Injury and pain</p> <p>“I have some back problems and I can’t walk more than a couple of hundred meters without having to stop (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“Well I’ve got a bad knee and when I’m doing nothing if I start walking it plays up with me and restricts my walking. Well I’ve got a bad knee and while I’m not doing nothing if I start walking it plays up with me and restricts my walking. Although I must admit that I took my neighbour’s dog for a walk yesterday and I was really glad that she stopped to smell the grass a few times so I could have a spell...” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p> <p>“I use to do a little physical exercise at home, push ups and stuff like that, but with age and arthritis it sort of starts to limit what I can do now” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>“About 12 months ago I started doing some stuff with the men’s group. Going to the gym and they go every Tuesday morning at 9.30 till 10.30 but you can go anytime you like if you are in that group so I used to go in earlier. And I rather enjoyed that but I don’t my shoulder in. I said to <i>physio’s name</i>, I’m sorry but I just can’t be bothered” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“I have been unable to ride a bike and perhaps jog but I do not walk as far as I used to. I have had a pinched nerve in my back and that has sort of affected my walking a little bit but that had nothing to do with the prostate operation.” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p>
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	<p>Treatment related comorbidities</p> <p>“It is. Very much so. I used to play golf with my son-in-laws but I haven’t had a game of golf for 5 years. You cant walk around – pass wind – find a big stain on trousers.” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“[after prostatectomy] I used to do gym work pre operation but I do not do weights now.” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“...but are you dribbling as well [from treatment], because older men leak as women do and it get’s embarrassing. And I think these things stop people from exercising” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p>
<i>Distance and cost</i>	<p>“ There is a barrier in that we are two, three km out of town. So you’ve actually got to get in the car and make an effort” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“ I said I am sixteen Ks [kilometres] out, I said I have got to look at every cent I make because I am on a pension. I can’t go and just check the letterbox.” (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p>
<i>Time</i>	<p>“I’m not organised enough to devote time some to- so I only do the walking- that’s about all I do. I don’t—er, I do sometime try to walk sometimes reasonably briskly but I don’t eh, used any of the weights or the exercise machine these days.” (William, 71yrs, metro, post graduate studies, 180months, localised disease)</p> <p>“... I’ll be too busy during the day to be able to get on there.” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p>
<i>Weather</i>	<p>“Freezing cold morning, you don’t really want to go” (Mark, 73yrs, rural, tech school, 60 months post,</p>

	<p>localised disease)</p> <p>“But its too hot and humid most of the time” (Charles, 71yrs, metro, bch degree, 120 months post, localised)</p> <p>“Been horrendous down here, rain scrawls day after day, so you cant go out, sit down a lot and that’s not good for you. I find that depressing...Motivation, gale force winds- seriously it’s the weather that affects my ability- Bitterly cold and freezing season.” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“Ah too hard, I’ll do it tomorrow, maybe if the weather is good” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p>
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Supplementary Table 3: Topic 3: Internet and Programming, themes, subthemes and illustrative quotes

<u>Theme: The Internet</u>	
Subtheme: Use	<p>“Constantly...Obviously email. Private and personal, at work constantly...yeah, well work [email] is constant. I was on the bloody phone, you never escape and I suppose its my own issue...I use it a lot for ,um, I spose research-looking into stuff- inquiring, news, um, I use it a bit for catch up TV” (Charles, 71yrs, metro, bch degree, 120months post, localised disease)</p> <p>“Yes. I use it a lot...Concurrent with all that [radiation treatment], I spent my life then on the internet” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“Oh yeah, my wife always says get off the computer” (Ronald, 65yrs, metro, year 10, 10 months post, local advanced)</p> <p>“But er I check it each day” (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p> <p>“Once or twice a day, if not more” (Fred, 74yrs, year 10, 96months post, localised disease)</p> <p>“No I’m completely illiterate- I haven’t even got a computer or anything” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p> <p>“Not at all... I used to use it when I was working but when I retired in 2001, I said that’s it, the computer can stay on the desk does not use... Done, finished. My wife uses it all the time. She does the banking; She does everything on the net. I don’t have to.” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“Yeah that sounds alright, but like I said, this computer is still new to me, and if things go wrong, sometimes it won’t print for me – I don’t know how to fix it. Like I got a printer and if I see something on Google or whatever, and I like a lot of aviation stuff I print it off – cause otherwise I can’t get back to it the next time I try to find it.. can’t get back to it on the computer, so I’m still learning.” (Graham, 78yrs, rural, year 9, 84 months post, localised</p>

	<p>disease)</p> <p>“I use it all the time for work and for research and planning my holiday at the present...A lot of holiday stuff but predominantly I use the internet for education.” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“Yeah I mean getting our mail, and talking on skype to our son and whatever else Um, well I’m sort of into 4 wheel driving a hell of a lot, I’m looking at buying electrical equipment, like cable and connectors and and whatever else, solar panels, and all that sort of gear... and found on on the internet through YouTube there was er, a video which showed you how to remove the door and the door lock and- yeah” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“ I’ve recently googled looking for a second hand caravan” (Brian, 74yrs, rural, tech school, 60 months post)</p> <p>“But er I check it each day, um, oh sometimes I look at Facebook and if there is anything that I particularly want to know um, the internet is a brilliant tool.” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>“I use uncle Google a lot but none in particular, if I have not got a website and I want to know something I will go to Google and generally I can find it” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“... I go on the internet and check the [sport] scores” (George, 75yrs, metro, post grad, 180 months post, local advanced disease)</p> <p>“I got- cos I got- cos before I actually got the operation- I went online and had a look at the operation and how its performed you know out its performed and whatever- <i>soft laugh</i>- I have to admit I was a bit shocked.” (Fred, 74yrs, year 10, 96 months post, localise disease)</p> <p>“So I took a lot of photos there and I’ve up loaded them and put them er put them to them to google photos and and er, put links on Facebook and um, I have my own website...I’m a fairly activate Facebook user”(William, 71yrs,</p>
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	<p>metro, post graduate studies, 180months, localised disease)</p> <p>“I’m interested in it cos it’s the way its going and with all the government departments- they assume the that everyone’s got the Internet. A lot of people haven’t got access. And here in <i>rural name</i> there are black spots everywhere” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>[access in libraries or courses to learn] You can but its very limited- The university of the third age, U3A there is one in <i>regional centre</i> they have courses but they cost money. And that’s another issue, people are watching every penny these days um, you gotta justify that expense. There should be more free courses, there are some here in <i>place name</i> but you can’t always getting to them when they are on...I’ve got a computer sitting at home that a friend of mine gave me, um I want to get using that and um, but how quickly I can get up to speed remains to be seen because you need to practice it every day” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“Its natural to you, you’ve grown up with it, but you’re dealing with the senior section of the community and its foreign to them. Put it in that way. Its like going back to primary school again, you’ve got to learn you’re A B C’s. It’s the same type of thing. Young people these days, and professional young peoples in their 20’s and 30s- they don’t understand that. They might proficient at what they do, I don’t criticise them for that- but they don’t understand that its so much more difficult for people who haven’t grown up with computers. But still have the desired and the capacity to learn... I’ve met a lot of chaps here, and they might be a bit frail but they’ll be a sharp as a tack. They’ve got the ability. And that’s partly, of what keeps me going. The more active I am, the longer it will be until I get dementia hopefully” (Brian, 74yrs, rural, tech school, 60 months post, localised disease)</p> <p>“I probably would [learn]. Yeah. But its another thing I have to find time for” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p>
Subtheme: Access	<p>“Ah, I haven’t really got into the computer yet. I am having trouble with this bloody [smart] phone (laughter)... Also you have got to think of cost. I am on a pension.” (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>“ Um, I’ve just got this smart phone to go with the paper delivery because they track us now up and down every</p>



	<p>street and um I'm slowly mastering the smart phone and its various foils that that's got.... that's another issue, people are watching every penny these days um, you gotta justify that expense. There should be more free [computer literacy] courses, there are some here in <i>place name</i> but you can't always getting to them when they are on... The other issue is because we are on a full pension, you need that supplementary income purely to survive". (Brian, 74yrs, rural, tech school, 60months post, localised disease)</p> <p>"I've got a computer sitting at home that a friend of mine gave me, um I want to get using that and um, but how quickly I can get up to speed remains to be seen because you need to practice it every day" (Brian, 74yrs, rural, tech school, 60months post, localised disease)</p> <p>"No I'm completely illiterate- I haven't even got a computer or anything... Well seeing that I'm not on the internet at all I can't see any relevance to [in an online health program] at all" (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p>
<u>Theme: Preferences for Websites</u>	
Subtheme: Simplicity	<p>"As simply as possible- I hate all the bells and whistles... Um, I reckon a lot of websites- um, are trying to sort of outdo each other -in terms of of funkiness for want of a better word." (Chalres, 71yrs, metro, bch degree, 120 months post, localise disease)</p> <p>"I mean some people love these bells and whistles and funny fancy graphics and moving things... I think its more important to have up to date information and accurate information..." (William, 71yrs, metro, post graduate studies, 180 months, localised disease)</p> <p>"The biggest fear for me would be the program designer. If its slightly frustrating to use, the compliance is minimal." (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>"Its quite important that it not hard to read...and easily digested" (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p>
Subtheme: Quality	"If I was looking for something to help me with my exercises I would certainly be able to see a video of someone

information	<p>doing to something” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“ Yeah video. Look even in my trade, I can’t learn by reading a book, I’ve got to have something to sort of teach you and go along with it, then I can read the book and then pick it up better.” (Graham, 78yrs, rural, year 9, 84 months post, localised disease)</p> <p>“You get that instant short feedback of information. A snippet of information and then you provide the areas that you can go detailed” (Brian, 74yrs, rural, tech school, 60 months post, local disease)</p> <p>“I don’t want it too full of unnecessary information, I want to be able to find what I want.” (Harry, 75yrs, metro, year 11, 4 months post, localised diseased)</p> <p>“[combination of text, audio and video] Oh yes definitely” (Bill, 83yrs, rural, year 9, 72 months post, localised disease)</p> <p>“I think a combination...Having many clicks to get somewhere is sometimes very annoying” (William, 71yrs, metro, post graduate studies, 180months, localised disease)</p>
<u>Theme: Preferences for an online physical activity program</u>	
Subtheme: Length	<p>“Oh... 8-12 weeks sounds like a bit of an imposition.... Yeah I think it’s just a bit long to maintain interest...I think it might work better- cos you throw in um it in with um face to face, I thin that’s were the crunch, cos its really easy its to lie to the computer... I mean, mine does it all the time- I mean but you got someone sitting there- be it the dietician be it the GP –its- human nature is- you’re gonna be much more likely to tell the truth.” (Charles, 71yrs, metro, bch degree, 120months post)</p> <p>[8 weeks?] “Seems and awful long time” (Maurice, 56yrs, rural, bch degree, 36 months post, localised disease)</p> <p>“You wouldn’t want it any longer than that [8 weeks]. It depends on how active the program is- 6 could be long enough if you are doing something different each time” (Mark, 73yrs, rural, tech school, 60 months post, localised</p>

	disease)
Subtheme: Website architecture	<p>“If it’s the case of cherry picking, it’s about getting enough of what you need. You know, you might not know unless you saw it all....a logical layout with steps” (Fred, 74yrs, year 10, 96months post, localise disease)</p> <p>“It has to be regimented, you can’t have it ad-hoc. I think having it regimented is a good idea...” (Mark, 73yrs, rural, tech school, 60 months post, localised disease)</p> <p>“Oh, that’s where I think you need a more structured approach.” (Raymond, 61yrs, rural, year 10, 60 months post, local advanced disease)</p> <p>“Yeah probably better [free choice] than the first option [logical model], you know controlling your own destiny virtually. I think both options are good but I think the second one in my view and it would suit my situation better you could jump from one to another.” (Peter, 76yrs, rural, year 11, 36 months post, localised disease)</p> <p>“I would say the second one [free choice], probably more suitable to someone in my position, cos quiet often I’ll be too busy during the day to be able to get on there...As long as you don’t get lazy and get out of it for too long.” (Gordon, 78yrs, metro, bch degree, 10 months post, local advanced disease)</p> <p>“The majority of people in my experience do not like constantly being told, they like to have an element of choice.” (Charles, 71yrs, metro, bch degree, 120months post, localise disease)</p> <p>“Oh free choice for sure” (William, 71yrs, metro, post graduate studies, 180months, localised disease)</p> <p>“Well if the website can tailor itself to a particular person, that’s er gotta be a plus” (Harry, 75yrs, metro, year 11, 4 months post, localised disease)</p> <p>“Let people make choice. Uh, they can see-they can find things that work to their liking. I think that would be intelligent.” (George, 75yrs, metro, post grad, 180months post, local advanced disease)</p>

## *Chapter 5*

How Does the Architecture of a Computer-Tailored Physical Activity Website Impact Engagement in Among Post-treatment Prostate Cancer Survivors? A Randomised Controlled Trial

## Statement of Authorship

### Statement of Authorship- Chapter 5

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Name of Principal Author (Candidate)	Amy Finlay
Contribution to the Paper	Conceptualisation of program, coding, writing content, recruitment, data analysis, manuscript original draft write up,
Overall percentage (%)	60%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.
Signature	<div> <div></div> <div>Date</div> <div>9 / 7 / 19</div> </div>

By signing the Statement of Authorship, each author certifies that:

- the candidate's stated contribution to the publication is accurate (as detailed above);
- permission is granted for the candidate to include the publication in the thesis; and
- the sum of all co-author contributions is equal to 100% less the candidate's stated contribution

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How Does the Architecture of a Computer-Tailored Physical Activity Website Impact Engagement in Among Post-treatment Prostate Cancer Survivors? A Randomised Controlled Trial

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## Abstract

**Introduction:** Web-based computer-tailored interventions are pitched as one promising way to assist prostate cancer survivors to become more physically active. However, online programs face decreasing engagement. This study aimed to explore how changing the website architecture (free choice vs. standard tunnelled) of a physical



activity computer-tailored intervention targeting prostate cancer survivors influenced online module engagement, acceptability and preliminary efficacy outcomes.

**Method:** On a 2:2:1 ratio, 71 Australian prostate cancer survivors (mean age: 66.6 years  $\pm$ 9.66) were randomised into a free choice (N=27), a standard tunnelled (N=27) version of a 4 week computer-tailored intervention, or into the non-tailored control (N=17). The control group received links to usual care prostate cancer websites. The interventions in both experimental arms contained the 4 weekly physical activity logs alongside 4 ‘once off’ advice modules labelled “getting started”, “goals and barriers”, “social support” and “habit formation”. The tunnelled arm received weekly modules (‘once off’ advice + corresponding physical log). The free choice arm could access any of the ‘once off modules’ at any time, but the physical activity log was still to be completed once a week. The primary outcome was a two-group comparison between the free choice and the standard tunnelled arm examining differences between physical activity log module engagement, measured via internal web analytics. ‘Once off’ module engagement was also examined. Three group comparisons (with control) explored differences in acceptability, relevance, and physical activity behaviour change via post intervention survey.

**Results:** Across the four-week period, the average number of weekly physical activity module use was higher in the standard tunnelled arm (M 2.6 SD 1.3) compared to the free choice arm (M 1.5 SD 1.39),  $p = 0.01$ , adjusted  $p = .005$ . Free choice participants were significantly more likely to have engaged with the social support ( $p = .008$ ) and habit formation ( $p = 0.003$ ) ‘once off’ modules compared to the standard tunnelled arm. This difference was the result of non-usage attrition in the tunnelled arm, as participants received these messages in weeks 3 / 4. Three group secondary outcome comparisons lacked power. There were no differences found for between groups regarding on acceptability, engagement, and relevancy outcomes, all of which received low/moderate scores, indicating room for improvement. Post intervention moderate to vigorous activity minutes per week increased in both the free choice and control group (+54.37 (SD 326.65) and +78.23 (SD 288.68) and decreased by average of 2 mins (SD 228.27) in the standard tunnelled group, however these results were not significant. Resistance training scores (number of sessions \* number of exercise) also increased across all groups however findings were not significant between and within groups. Qualitative

feedback indicated positive perceptions and a ‘good start’, however there was room for improvement. Suggestions included integrating the best parts of the program with a mobile phone version, or wearable trackers for physical activity logging.

**Conclusions:** This study indicated that website architecture influences behavioural engagement. Free choice participants engaged more with the ‘once off’ health advice content but were less likely to use the physical activity logs, and vice versa with the tunnelled participants. A greater understanding of these trade-off effects will be useful for informing the design of future web-based interventions.

Trial registration: ACTRN 12618000-80824

## Introduction

Physical activity is recommended as an important part of prostate cancer survivorship due to the many physiological (e.g. increased bone loading, muscle endurance, weight loss etc.) and psychological (reduced fatigue, anxiety and depression) benefits that can improve men's quality of life during and post cancer treatment (1-3). However, the vast majority of prostate cancer survivors are not participating in the recommended 150 minutes of moderate to vigorous physical activity and two or more resistance training sessions per week (4, 5). In order to support prostate cancer survivors to increase their level of physical activity and improve their quality of life, accessible and relevant support is needed. To accomplish this, online or computer interventions are a promising method to provide online behavioural support for prostate cancer survivors, however, there have been relatively few studies to date (6-8). While these studies have shown promise in a sparse field, these studies either had mixed cancer groups (bowel and prostate) in which the intervention did not prove effective for prostate cancer survivors (6), had little attention to physical activity within the intervention (7), or had a lack of tailored individual content and only focused on one treatment type of prostate cancer survivors (10). As there is little literature in this field, there is certainly room to explore new and diverse program approaches in an attempt to identify efficacious physical activity and prostate cancer survivor interventions.

Computer tailoring is one such a method which could be further explored. Computer-tailored interventions are a feasible, acceptable and efficacious method to deliver personalised and iterative behaviour change support *en masse* (6, 9). Furthermore, computer-tailoring techniques have been used in oncology in recent years (7, 10, 11). In brief, a computer-tailored program algorithmically maps a unique combination of messages to an individual. The personalised messages are based on pre-measured behavioural, psychological, or demographical characteristics (6, 12). Despite the interest and gains made in computer tailoring, there is still room for improvement, as there are issues with maintaining user engagement.

User engagement in this context is defined as both the extent of usage and the subjective user experience (13). This is characterised by participant attention, interest and affect, see Perski et.al. (13). Engagement is thought to impact on the overall

efficacy of online interventions by influencing the depth of involvement with the behaviour change process (e.g., effort and attention towards set goals) (13). As with other types of digital behaviour change interventions, most computer-tailored interventions report issues with usage that declines over time (9, 14-16). As a result, participant exposure to persuasive behaviour change techniques presented in the later parts of a program is often compromised. In addition, although computer-tailored interventions are often rated as more acceptable than non-tailored interventions, and the delivery of personalised content has been shown to increase attention, process evaluation results still tend to show the user experience could be improved (17). To increase program engagement, experimentation is required to understand what aspects of programs could potentially influence online engagement for prostate cancer survivors.

One under studied area is the impact of the program architecture within computer-tailored websites. Traditional computer-tailored interventions use ‘tunnelling’ techniques (12, 18, 19). Tunnelled programs provide small packages of information in a set order that are delivered over time. This ideally is to avoid overwhelming the participant and to guide them through the behaviour change process (12, 18, 19). While increased guidance is a key advantage of this architecture style, it may also limit a participant’s level of autonomy within the intervention. Increasing autonomy could grow a person’s sense of intrinsic motivation within online interventions (20). As behaviours that are intrinsically motivated are more likely to be maintained (21), offering more opportunities for autonomy could result in enhancing levels of program engagement. Additionally, autonomy supportive architectures may be especially important for prostate cancer survivors, as autonomy and control are seen as a key masculine ideal which can be threatened by a prostate cancer diagnosis (22). However, the impact of different forms of website architecture has yet to be explored.

There has been limited experimentation in the computer-tailored intervention website architecture field. One recent study compared three different delivery schedules of the same tunnelled module content to breast cancer survivors (23). This study indicated a trade-off effect between completion of modules (favouring weekly group) versus acceptability and actual behaviour change (favouring monthly group) (23). Additionally, a recent systematic review found only three website architecture

experimentation studies (24), and to our knowledge only one study has been published after this review (23). Two of the website architectural experiment studies compared a tunnelled tailored condition to a non-tailored control (25, 26). The tailored arms in these studies were superior. This is unsurprising as tailored interventions are generally more effective than non-tailored interventions (27). Finally, one study compared a tunnelled tailored program aiming to influence knowledge of hepatitis, to a tunnelled tailored version where participants could skip website pages to a non-website control (28). Those in the ‘skipping pages’ arm reported higher perceived acceptability of the website, though the standard tunnel had greater information retainment post intervention (28). This study lends some support to the notion that autonomy may improve the user experience; however, it also suggests that autonomy may result in less exposure to intervention content, at least within tunnelled interventions. The impact of this trade off on behaviour change is unclear from the available literature. It may be that autonomy supportive interventions allow people to self-tailor, and that this may increase perceived intervention relevance. This could have positive impacts on both engagement and efficacy, depending on individual’s ability to self-tailor content to meet their needs.

A comparison of a computer-tailored behaviour change program that differs not in content but *only* in website architecture is needed. Therefore, the primary aim of this randomised controlled trial was to determine differences in online engagement between a standard ‘tunnelled’ version and free choice version of a computer-tailored intervention promoting physical activity to Australian prostate cancer survivors. The secondary aim was to collect data acceptability, website relevance and preliminary efficacy of the two arms in terms of physical activity behaviour change compared to a non-tailored control. This study is the first of its kind to compare how changes in the website architecture impact participant engagement with the same tailored information.

## Method

### *Study Design*

This study was a parallel 3-armed randomised control trial with two computer-tailored intervention arms and a non-tailored control. Participants were randomised into a 2:2:1 ratio by an automatic computer-generated algorithm embedded within the website. Both participants and the research team were blinded to the randomisation. The

study protocol was registered prospectively with the Australian New Zealand Clinical Trials Registry (identifier ACTRN 12618000-808246). The University of Adelaide Human Research Ethics Committee (H-2017-101) granted ethics. This study was informed by the Consolidation Standards of Reporting Clinical Trials (CONSORT) (29). The participant study flow, including study retention, is represented in Figure 1.

Insert figure 1 about here - participant study flow

### *Recruitment*

Recruitment for the study was multifaceted. Urologists, allied health professionals, prostate cancer nurses, doctors, a university's men's health center, a prostate cancer registry consumer advocate, and a state based medical registrar-training center's monthly newsletter promoted the study. A national men's health organization, a national prostate cancer organization (and their support groups), and the national urological nurses' newsletter also dispersed the study information. Furthermore, social media ads were also used to promote the study.

### *Procedure*

Participants completed the online eligibility survey (see supplementary document 1) which included a safety check for medical fitness (PAR-Q, (30)). Eligible participants were instructed to click "I agree" to acknowledge that they had read the study information and provided their informed consent. Participants were blinded to the true aim of the study. After randomisation, participants completed the baseline survey and then were automatically able to access their arm's intervention's website home page. Data analysis was conducted on all participants who completed the baseline survey. The post intervention survey was completed via the study website at the end of the four-week intervention. Participants received a personal reminder email and a follow up call from the lead researcher (AF) if investigators did not receive the final research survey after one week.

### *Selection Criteria*

Participants were required to be living in Australia; over the age of 18 years; diagnosed (any time) with localised prostate cancer (stage 1-3); completed primary treatment (any time); in remission; either meeting the aerobic *or* resistance training components but *not both* components the oncology physical activity guidelines (150 minutes of moderate-vigorous aerobic activity and two resistance-training sessions per week) (4); be able to read and write in English; have access to a computer and the Internet; and have no medical contraindications to exercise. Exclusion criteria included prostate cancer survivors who were on active surveillance; or with terminal and/or metastatic disease; those who had medical contraindications to exercise; did not have a doctor's permission to participate; and who were meeting both the aerobic and resistance component of the physical activity guidelines.

### *The Interventions*

The program was marketed as Prostate Cancer Health and Fitness (PCHF) online ([www.pchf.net.au](http://www.pchf.net.au)) whose aim was to promote the uptake of both aerobic and strength based activity to Australian prostate cancer survivors. A two-part qualitative investigation (N=16 prostate cancer survivors) was used to support the design of PCHF, the results of which will be published elsewhere. The first qualitative study asked participants to give feedback on non-tailored messages to identify salient tailoring aspects for the PCHF program. This study indicated that men wanted short and simple messages for the most part. Overall, the general benefits of exercise appeared to be well received and would not require tailoring. However, the study indicated that *how* information was communicated to men about how to improve their physical activity would need to be tailored based on preferences.

An example of how this was implemented within PCHF would be noting differences in social support preferences. While Social Cognitive Theory (31) posits that behaviour change driven by self-efficacy is better supported when an individual has

a social network around them, many persons in the qualitative study reported not wanting to exercise with others. As such, PCHF tailored advice based on reported participant preferences. Participants could choose from “I like to exercise alone. I'm pretty good at sticking to things when I set them”, “I like to exercise mostly alone, but sometimes it helps with someone else asks if they come with me can be good”, “I tend to like to do things by myself but to be honest, I'm not great at sticking with it”, “I like a mix, sometimes alone and sometimes with others. Depends on how I'm feeling or the activity I'm doing” or “I like being with a friend, partner or group when I do activity”. This was followed up by a question asking if participants were satisfied with the level of social support. Each combination these messages had different advice to allow more tailoring to the individuals. The second part of the qualitative study that supported the design of PCHF was semi-structured interviews with prostate cancer survivors. The participants overall valued their health but find it hard to stay motivated due to issues such as pain, injury, finding the time, general motivation and weather. These factors were deemed important to increase the relevance of physical activity messages targeting prostate cancer survivors (to be published elsewhere).

Both the free choice and the standard tunnel intervention arms contained the same computer-tailored feedback and differed *only* in the website architecture. The intervention content targeted physical activity determinants outlined by Social Cognitive Theory (SCT) (31), Habit Theory (32), and applied previous theory mapped behaviour change techniques (33), as per Table 1. The messages used supportive language, in line with promoting intrinsic motivation (relatedness, competence and autonomy), drawing from Self Determination Theory (20, 34). For example, using relatedness statements such as “you’re not alone” or “many people”, or promoting autonomy by asking “what might work for you?”. Additionally, a behavioural scientist (CES) and an exercise physiologist (HE) screened the messages for accuracy, flow and safety.



### Intervention Content

There were two forms of content contained within PCHF. The first was considered ‘once off’ content, which did not require ongoing participant input, see Table 1. These four modules were theoretically mapped to Social Cognitive Theory (31). The modules were “getting started”, “goals and barriers”, “lone ranger or socialite-physical activity with others”, and “making long term changes”. In brief, the “getting started” module promoted the oncology physical activity guidelines, the benefits of physical activity, and provided tailored information based on age and comorbidity functional impairment status. The “goals and barriers” module described basic and advanced goal-setting approaches, as well as personal barrier related information (i.e. advice on making time, weather, low motivation, incontinence etc.). The “lone ranger or socialite- physical activity with others” module contained advice relating to social support, tailored to participant reported social preferences. Finally, the “making long-term changes” advice module provided once off behaviour change tailored information regarding habit formation (32), relapse prevention, motivation (31), and website links to more support.

The second form of intervention content required multiple inputs from users over time. Four weekly modules gave written tailored and iterative feedback about the user’s physical activity participation. These modules utilised goal setting, and self-monitoring based on Social Cognitive Theory. Each week (except the first), the module asked participants and gave feedback regarding their previous week’s goal. The module also prompted participants to think about the next week’s goal. Graphical representation of participant’s self-reported moderate-vigorous minutes and resistance training was provided. Each week’s graph had the previous data to allow participants to look their data patterns overtime.

### Website Features

Both intervention arms contained additional features including an “Ask an Expert” email function that allowed users to submit a question to an accredited exercise physiologist. The answer was sent directly to the participant via an email from the

exercise physiologist (HE). The answer was also placed upon the website. To support participants with a higher need for cognition (35), additional in-depth articles on prostate cancer and health were provided in the library. This included links to scientific articles on prostate cancer, as well as general prostate cancer survivorship topics, such as sexual wellbeing, diet and exercise. The library section that contained hyperlinks to pre-recorded videos demonstrating resistance-training exercises (with and without a resistance band). Participants were sent automatic emails twice a week to remind them to log into the website. For screen shots of the website home pages, see Figures 2 and 3.

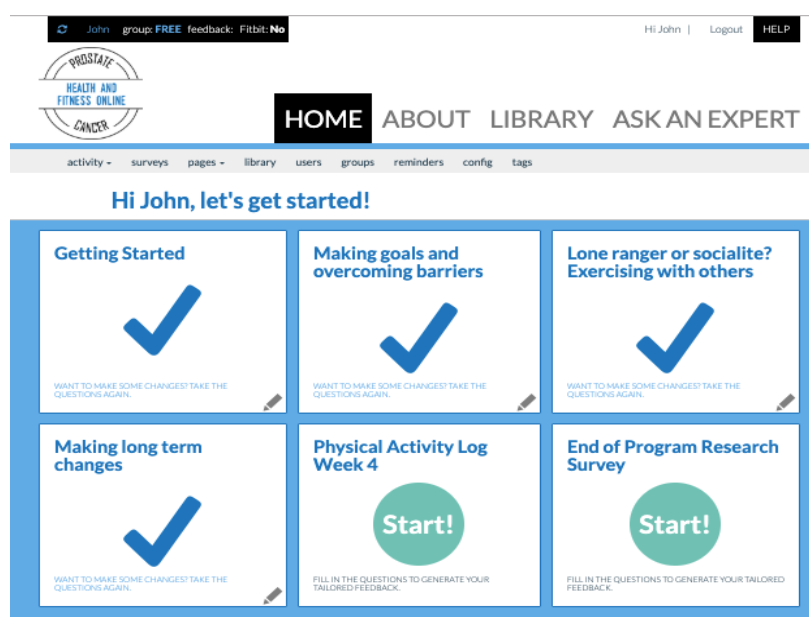


Figure 2: Free-choice website home page: This condition was designed to be autonomy supportive. Users could click on any topic at any time. The physical activity self-monitoring and feedback was supported by clicking on the physical activity log module. This automatically updated according to what week of the program the user was up to.

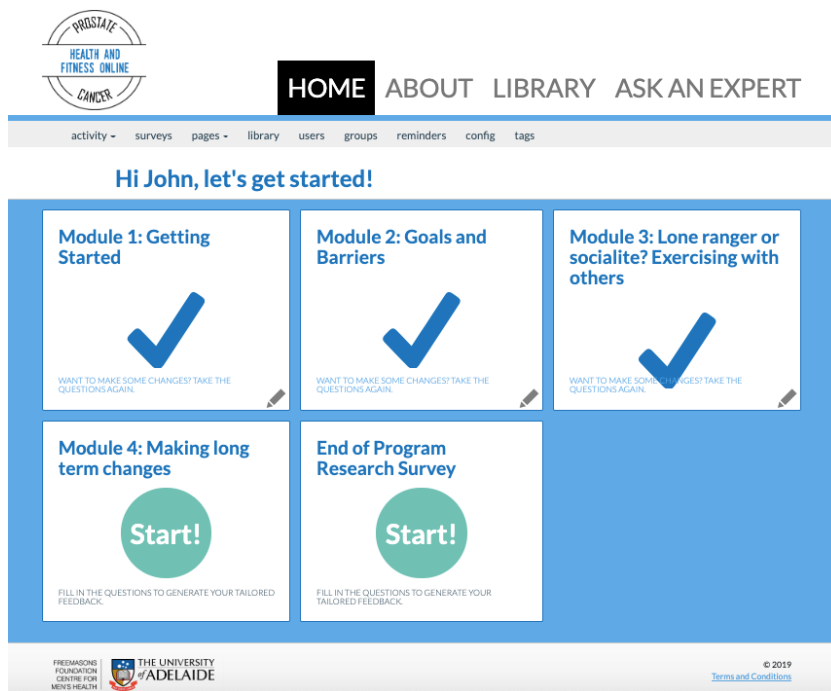


Figure 3: Tunnelled website home page: A new module was unlocked each week, over four weeks; Physical activity self-monitoring and feedback was provided within each module, alongside the “once-off” content designated to that week.

## Intervention Arms

### Standard Tunnelled Intervention

Participants randomized into the standard tunnelled arm received a single ‘once off’ advice module and a physical activity log module in one combined weekly module. As is typical in computer-tailored interventions (12), the health advice modules were ‘dripped’ to users in a logical order based on the proposed process of behavior change (see Table 1). In this arm, participants received the ‘once off’ advice *and* the physical activity log together in one larger module. For example, participants would open “getting started” module coupled with the physical activity log for week one. Whereas, in the final week, participants received the “making long-term changes” module aiming to help them sustain any changes made through habit formation, alongside the final physical activity log, which would provide feedback on progress over four weeks. The

participant could only access the next combined module after seven days had elapsed from completion of the week one content (see Figures 2 and 3).

#### Free Choice Intervention

Free choice participants had the same content as the standard tunnelled condition. However, the ‘once-off’ tailored advice modules were presented as stand-alone modules and could be accessed at any time and in any order. The physical activity log modules were also presented as stand-alone modules, with the relevant log for that week presented on the home page.

#### Non-tailored Minimal Control

Those randomized to the control arm had access to a home page that contained static information about the oncology guidelines and links to high quality, freely available Australian prostate cancer websites akin to usual care. For example, participants got a link to exercise recommendations from the Australian Cancer Council (large not for profit), see <https://www.cancersa.org.au/information/a-z-index/exercise-for-people-living-with-cancer>. However, this was not tailored information, and the control did not have access to the library or the ‘Ask an Expert’ function. After completing the final survey, those participants randomized into the control arm were offered a chance to use either version of the intervention.

Insert Table 1: Module content here

## *Measures*

### Demographics

Demographical characteristics collected at baseline via a self-report survey included age; education; marital status; employment status; postcode, recoded into remoteness levels via an online remoteness tool (36); cancer stage; cancer treatment(s); time since diagnosis; weight and height, and any comorbidities.

### Primary Outcome

Self-monitoring is one of the most efficacious behaviour change techniques for promoting physical activity behaviour change (37, 38). Therefore, the primary outcome was the difference in completion rates of the four *physical activity logs* between the participants in the free choice and standard tunnelled intervention arms, determined by assessing differences in total number of physical activity logs completed at follow-up (possible scores ranging from 0-4). Completion rates were calculated by the number of participants who completed the opening module survey and received the tailored feedback. Participants were divided into completed the log and receive the feedback *or* did not complete the log and receive the feedback. Differences in completion usage were assessed automatically and objectively using inbuilt website analytics. Proportion of users completing physical activity logs each week were also assessed.

### Secondary Outcomes

#### *Other Website Usage*

Participant usage of the four ‘once off’ modules was also collected via internal website analytics. As with the physical activity logs, participants were divided into completed the module and receive the feedback *or* did not complete the module and receive the feedback, ranging from a possible 0-4 for the ‘once off’ module completions. The total engagement score of modules/logs completed was therefore out

of 8, (i.e., the four advice modules *and* four weekly physical activity logs; possible range 0-8).

### *Library Use*

Total and individual intervention arm library engagement measured in minutes spent on the page between the intervention groups was also monitored via internal web analytics.

### *Subjective User Experience*

The 12-item E-health engagement scale (39) was used to measure participant's subjective experience of the intervention. This scale asked participants "*to what extent did you find the program...*" on a series of characteristics such as "cool", "trustworthy" or "stimulating" with a 5-point Likert scale from strongly disagree to strongly agree. The average score was taken across the 12 items (max 5), where higher scores indicate a more positive subjective user experience.

### *Website Usability*

Website usability was measured through the 10-item system usability scale (SUS) with a average score above 68 indicating "above average usability" (40) via via the post intervention survey.

### *Website Acceptability*

Participant satisfaction with the website was measured using the Client Satisfaction Questionnaire (CSQ-8) (41), where the sum of the score is taken (ranging from 8-32), and where higher scores mean greater satisfaction (41). Perceived relevance of the intervention content was assessed using 3-items adapted from a previous

computer-tailored intervention for breast cancer survivors (42). Participants were asked if they thought the messages in the program were a) *very relevant to me*, b) *was very applicable to me*, and c) *if the messages felt like they had someone like me in mind* on a 5-point Likert scale from strongly disagree to strongly agree. An average of the items was taken with higher scores (max 5) indicating higher perceived relevance. This was measured the post intervention survey.

### *Physical Activity*

Participants' moderate to vigorous activity (MVPA) was measured using an adapted version of validated self-report Godin Leisure-Time Exercise Questionnaire (GLTEQ) (43, 44). Three adapted resistance-training questions for the number of sessions, exercises and repetitions were also asked (42). A total resistance training score was calculated by multiplying the number of sessions by the number of exercises per week, where higher scores indicated greater participation. The proportion of participants meeting the oncology physical activity guidelines ( $>150\text{min}$  of MVPA +  $\geq 2$  resistance sessions per week (4)) was measured as a continuous variable and then coded dichotomously at baseline and post intervention. This was measured the post intervention survey.

### *Qualitative Feedback*

Open-ended questions were asked to participants in order to gain general qualitative feedback. This included assessing participant's opinion of the exercise physiologist "Ask an Expert" feature and why they did or did not use this section. Participants were also asked to give feedback regarding the pros and cons of the website and suggestions for improvement. This was measured the post intervention survey.

### *Data Analysis*

All statistical analyses were performed using SPSS version 25 and Stata version 15.1. Descriptive statistics were used to describe the trial population. Group (free choice and standard tunnelled) comparisons were conducted using *t* tests (adjusted by ANCOVA) for continuous variable modules. Categorical group comparisons used chi-squared/fishers exact tests, with additional binomial regression models for adjusted modelling. Variables in the 2-group binomial regression model included age, location, education, work status, time-since treatment, number of co-morbidities and meeting baseline physical activity. Three group comparisons (free choice, standard tunnel and control group) were compared using ANOVA and ANCOVA modelling was used to explore differences in the user experience and website acceptability measures, adjusting for age, location, education, and time since treatment. Differences in the non-parametric physical activity used the Kruskal-Wallis H test was used to compare the moderate to vigorous activity (MVPA) data and resistance training outcomes between all three trial arms. A binomial regression model was used to detect differences between arms and meeting the oncology guidelines (MVPA + >2 sessions of resistance training per week). Variables included in the module were covariates included age, location, education, work status, time-since treatment, number of co-morbidities and meeting the guidelines at baseline. Finally, the post intervention qualitative evaluation comments were to be explored for frequency-based responses, or for unique points of view for intervention improvement.

### *Sample Size Calculation*

The primary endpoint was the total number of completed weekly physical activity log modules. The primary analysis was a two-group comparison between the free choice and standard tunnelled arms after four weeks. An assumed constant weekly intervention attrition rate of 40% in the tunnelled arm (45) and assuming the number of weeks completed is Poisson distributed (noting that the square root of a Poisson distribution is approximately normally distributed with variance 0.25). Therefore, randomizing 112 individuals equally between groups provided 80% power to detect a



mean difference of 0.1325 (i.e. change in attrition from 40% in 'fixed' to 25% in 'autonomous' using square root transform) in a two-group t-test (two-sided  $\alpha=0.05$ ). Randomizing one-fifth to a control group (randomization ratio 2:2:1) results in a total sample size of  $N=135$ , in block sizes of six. This would create goal recruitment for  $N=54$  in each of the experimental arms and 27 in the control. While a control group was not required for the primary outcome, the presence of a control group was required to assist interpreting results relating to acceptability and efficacy of the intervention for the secondary outcome. The control group's purpose was to compare usual care websites and non-tailored intervention.

### *Missing Data*

Statistical analysis was conducted using all observed data. The primary outcome data was available for 100% of the participants. A sensitivity analysis was conducted to assess the impact of missing data, as outlined by White et al (2011) (46). This has strategy has been used in previous cancer computer-tailored trial (42). The baseline physical activity scores carried forward for those with missing data. For Likert scale measures (Ehealth engagement scale, SUS, CSQ and relevance scores), the median was used for the missing data.

## **Results**

### *Participant Flow*

There were 411 individuals who clicked on the online screening tool between August 8<sup>th</sup> 2018 and March 15<sup>th</sup> 2019. Of those, 333 were excluded, with 255 who did not complete the screening tool, and 78 individuals who were not eligible to participate. There were 78 eligible participants randomised into the free choice intervention ( $N=31$ ), standard tunnel ( $N=29$ ) and the control ( $N=18$ ). The majority of participants were recruited through social media (34.6%), support groups (19.2%) and a national prostate

cancer survivors research registry (19.2%). After randomisation, only 71 participants (N=27 free choice intervention, N=27 standard tunnel and N=16 control) completed the baseline survey and were then able to access the intervention. The majority of the participants were recruited through Facebook recruitment efforts and the Prostate Cancer Foundation of Australia research registry and the associated support groups. The primary outcome had 100% of the data for those N=71 participants that received the intervention; no usage data was lost. There were 50 participants who completed the follow up survey for secondary outcomes (N=16 free choice, N=20 standard tunnel and N=14 control). Overall, 15 participants were lost to follow up (N=7 free choice, N=5 standard tunnel, N=3 control), and 6 participants withdrew from the study (N=4 free choice, N=2 standard tunnel, N=0 control). There were no differences in dropout between groups ( $p = .27$ ).

### *Missing Data Analysis*

Complete case is presented in the results below (2 group and 3 group comparisons). Imputed data for 3 group comparisons are presented in the secondary outcome tables. There were no significant differences between the complete case data and the imputed data were not significantly difference from each other in all secondary outcomes.

### *Participant Demographics*

The participant self-reported characteristics are presented in Table 2 (N=71). In general, participants were in their mid 60s (M 66yrs SD 9.6); well educated (47% completed high school or trade school, 53% with university or post graduate education); partnered/married (85%), retired (53.5%) or working full time (22.5%); from metropolitan (45%) or inner regional centres (27.3%) and represented all states and territories of Australia. Overall, participants (N=71) at baseline were highly active. The total group mean MVPA was 220.1min per week (SD 227.5), a median of 160 min per week, and 50.7% of participants meeting the aerobic component of the oncology

guidelines (>150 MVPA min per week). In terms of resistance training, the mean number of sessions per week was 0.98 (SD 1.6). The total resistance training score (sessions by number of exercises) at baseline was 20 (SD 43.9) for the free choice, 11.7 (SD 33.8) for the standard tunnelled group, and 2.58 (SD 5.6) for the control group, however these differences were not significant. There was 26.8% of participants were meeting the resistance training guidelines per week, with 22.5% meeting both guidelines components. Overall, the participants were in remission from stage three of prostate cancer (52.9%), had completed surgery (79%), and averaged 2.9 years (SD 3.0) since their diagnosis. Study completers were statistically more likely to have higher levels of education compared to those lost to follow up ( $p = .03$ ). Completers were also likely to have completed their treatment more recently, and were more active at baseline, however this was not significantly different (see supplementary Table 1).

Insert Table 2: Demographics about here

### *Primary Outcome*

Physical activity logs: From a maximum score of 4, the average number of physical activity logs was higher in the standard tunnelled arm (M 2.6 SD 1.3) compared to the free choice arm (M 1.5 SD 1.4),  $p = .004$ , adjusted  $p = .005$  (see Figure 4). The standard tunnelled arm was more likely to access all physical activity logs than the free choice arm, though both groups' engagement reduced over time (see Figure 4). The standard tunnelled arm had 96% of the allocated participants access physical activity log 1 compared to 70% of participants in the free choice arm (unadjusted  $p = .03$ , adjusted  $p = .018$ ). Log 2 had 74% in the standard tunnel versus 44% in the free choice (unadjusted  $p = .03$ , adjusted  $p = .02$ ). Log 3 had 52% in the standard tunnel versus 22% in the free choice (unadjusted  $p = .03$ , adjusted  $p = .03$ ). Finally, in log 4, 41% of participants in the standard tunnel used the log compared to only 15% in the free choice (unadjusted  $p = .04$ , adjusted  $p = .04$ ).

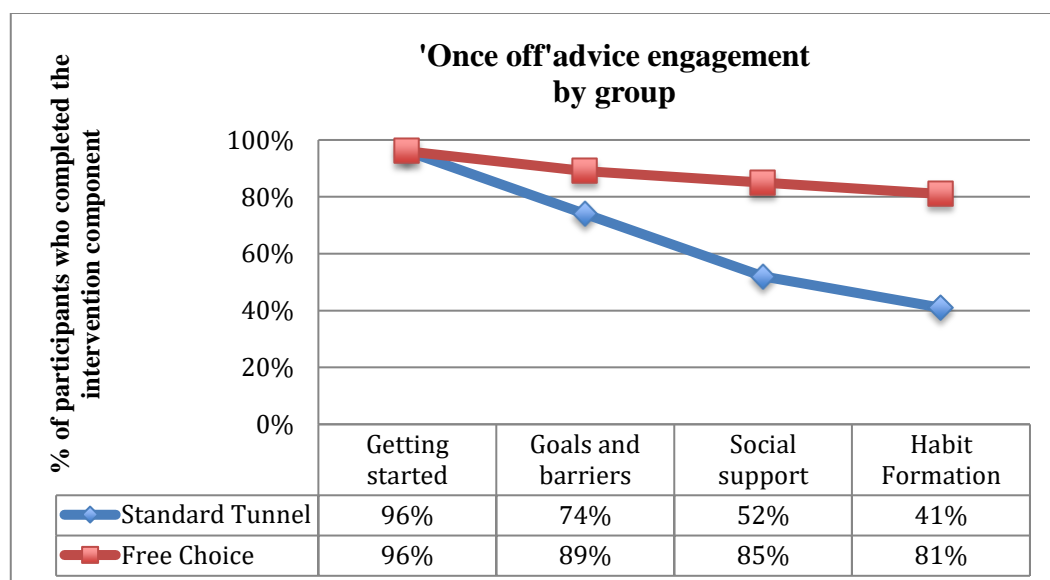
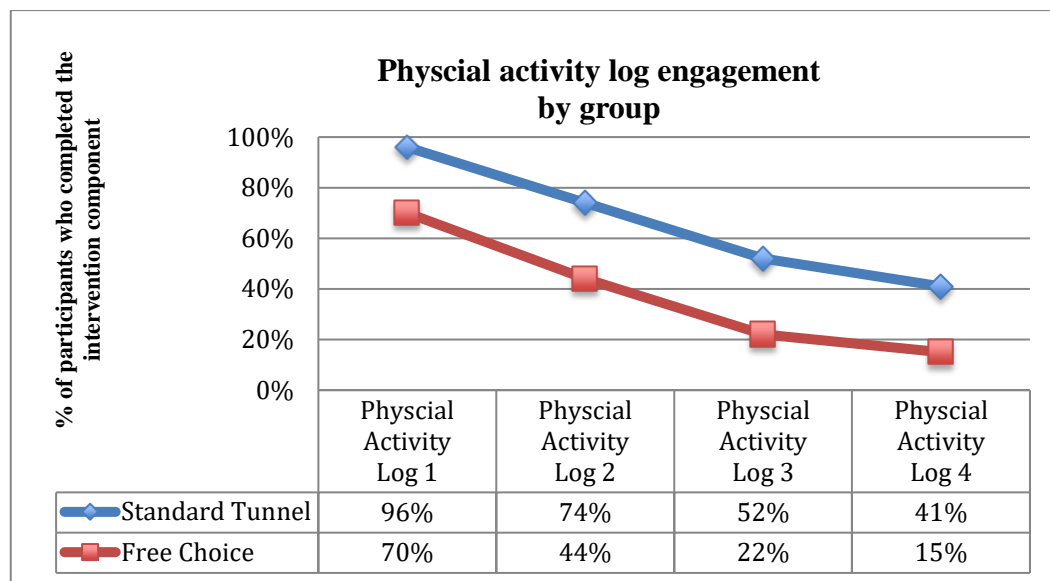


Figure 4: Website module engagement by group

### *Other Website Usage*

'Once off' modules: As both the "once off" modules and the physical activity logs were embedded in the same larger component in the tunnelled arm, the overall module engagement rates (i.e. 96% 74%, 52% and 41%) are the same as the engagement rates of the physical activity logs. Tunnelled participants only could access the final two 'once off' module components by staying in the program into weeks 3&4, but most of

the participants had dropped out by this point. In contrast, the free choice participants could engage with the ‘once off’ modules at any time. Most free choice participants engaged with all of the ‘once off’ modules in their first website visit but were more likely to disengage from the whole program and not come back to use the weekly physical activity logs. From a range of 1-4, the mean ‘once off’ module engagement was 3.4 (SD1.1) for the free choice arm, with an average of 2.5 (SD1.3) module engagement from the standard tunnel arm which was significant (  $p = .01$ , adjusted  $p = .02$ ). As per Figure 4, the standard tunnelled arm and the free choice arm both had 96% of the allocated participants access the “getting started” module (adjusted  $p = .59$ , unadjusted  $p = 1$ ). “Goals and barriers” had 74% participants engage with the module in the standard tunnel and 89% in the free choice arm. However, this difference was not significant (unadjusted  $p = .17$ , adjusted  $p = .17$ ). Participants in the free choice arm were more likely to have accessed both the ‘social support’ (unadjusted  $p = .01$ , adjusted  $p = .02$ ) and ‘habit formation’ advice compared to the tunnelled arm (unadjusted  $p = .003$ , adjusted  $p = .005$ ).

Overall program engagement: Overall program engagement was assessed all 8-intervention components (4 ‘once off’ advice modules + 4 physical activity logs). Both arms engaged with approximately 60% of the possible website modules in the main conditions, excluding library use. The standard tunnelled arm accessed an average of 5.3 (SD 2.7) module/physical activity log components, whereas the free choice arm averaged 5.0 (SD 2.2) module/physical activity log components. This difference was not significant (unadjusted  $p = .7$ , adjusted  $p = .5$ )

### *Library Use*

The library function was used by 29.6% (N=7 tunnelled, N=9 free choice). However, there were no statistical differences between users and non-users between the two intervention ( $p = .77$ ). Taken together, the participants in both experimental arms used the library for average of 3.1 minutes (SD 5.3mins, range 1 second to 20.8 minutes). By intervention arm, the free choice arm averaged 3.99mins (SD 4.1 mins)

using the library compared to 3.89mins (SD 7.7) of the standard tunnelled group, and these differences were not significant ( $p=.8$ ).

### *Subjective User Experience*

Overall the, the self-reported engagement score was low to moderate with no significant differences between arms in adjusted or unadjusted models ( $>0.05$ ), see Table 3. From a maximum score of 5, the free choice arm averaged 2.2 (SD 0.94), the standard tunnelled averaged 2.2 (SD 0.93), and the control group averaged 2.2 (SD 0.87). These differences were not significant ( $p=.8$ , adjusted  $p = .4$ ).

### *Website Usability*

The average SUS score ( $>68$  is above average) for the free choice arm was 56.4 (SD 12.2). The standard tunnelled group had a higher average of 67.4 (SD 14.6), and the control group reported an average score of 57.7 (SD 17.5) (see Table 3). These differences were not statistically significant (unadjusted  $p=.06$ , adjusted  $p=.06$ )

### *Website Acceptability*

The Client Satisfaction Questionnaire (range 8-32) scores indicated moderate acceptability, however differences between groups were not significant ( $p>.05$ ). The free choice arm (M 17.7, SD 5.3) reported slightly higher acceptability scores than the tunnelled arm (M 14.9, SD 8.3). The control arm had similar levels of satisfaction to the free choice arm with a mean of 17.3 (SD 6.5). As per Table 3, the average relevance score (max 5) from the 3-item relevance measures was 2.4 (SD 1.1) for the free choice arm, 2.8 (SD 1.3) for the standard tunnel group, and 2.4, (SD 1.2) for the control, however these differences were not significant, (unadjusted  $p=.4$ , adjusted  $p=.6$ ).

### *Physical Activity*

Moderate to vigorous activity: There were no statistically significant differences between groups at the post intervention time point in moderate to vigorous activity ( $H(1) = 2.7, p = .1$ ), see Table 4. The aerobic activity levels at baseline and post intervention had large variance around the mean at all time points. The free choice group increased their activity level by an average of +54.4 MVPA min (SD 326.7), (see Table 4). The standard tunnelled group's pre/post MVPA levels stayed relatively the same, losing an average of 2 MVPA minutes (SD 267.5). The control group, who had access to non-tailored usual care, increased their MVPA by an average of +95min (SD 317.6), however these differences in pre/post measures between groups were not significant ( $H(1) = .84, p = .31$ ).

Resistance training: Resistance training scores (number of sessions \* number of exercises) increased in all three arms, however there was no statistical difference between the interventional arms and the control. There were no differences between post intervention scores between groups ( $H(1) = .220, p = .64$ ). In terms of pre/post changes, the free choice group increased their resistance score an average of +2.5 (SD 60.5) units in the resistance training score. The tunnelled arm increased an average of +11.8 (SD 62.1), and the control group increased by +16.71 (SD 28.5). These scores were not significant between groups ( $H(1) = .345, p = .56$ ), see Table 4.

Meeting the oncology guidelines: All three arms increased in the percentage of individuals meeting the guidelines of 150min of moderate to vigorous activity (MVPA) and two or more resistance sessions per week post intervention (see Table 4). However, meeting the guidelines at the post intervention point was not statistically different between groups ( $X^2(2, N=50) = 1.02, p = .6$ ). The results of the binomial regression model indicated there were not significant associations between age, marital status, location, work status, time since treatment or meeting the guidelines at baseline on the outcomes of those meeting guidelines post intervention ( $p = .08$ ). However, co-morbidity and education were predictors in this model ( $p < .05$ ), see Table 5.

### *Qualitative Feedback*

The “Ask an Expert” feature was relatively based on the qualitative feedback, but not used. Only one participant of either intervention arm (1/54) used the feature and reported that they were satisfied with the answer they received. Of the 27 participants (50% response rate) in the intervention arms who gave feedback on this feature in an open response text box, the largest response was that the participants’ thought this feature was unnecessary (51.9%). The remaining feedback reflected a lack of time to engage with the ask-an-expert feature (18.5%), did not see the feature on the website (14.8%), no specific reason for not using the feature (11.1%) and cannot remember using the feature (3.7%). One tunnelled participant used the “Ask an Expert Feature” from all 54 intervention participants. There were 29 participants who chose to give written feedback (N=8 free choice, N=12 tunnelled, N=9 control). The qualitative feedback from those in the intervention group did not tend to differ between groups and was moderately positive in tone. Three participants indicated that the program concept was valued, though the execution needs work. For example, intervention comments included “a fine effort and well worth continuing”, “a good start” and that “the programme would be fantastic for anyone who doesn't know where to start or has no backup”. Two participants specifically mentioned the hyperlinks in the library and considered them important (hyperlinks related to sexual health information and exercise videos).

Issues of content relevance were noted, for example, comments from individuals included “better feedback is needed”, “I did not find many of the activities applicable to me or my lifestyle”, and “I need a program that works on my sexual fitness not my physical fitness”. For those in the control arm, four control participants specifically said that they continued with their “own routine”. Two participants reported that the control version of the website was either “underwhelming”, or “I did not feel that I was participating in an exercise program at all.” From the feedback, potential improvements included providing a higher variety of resistance exercises for different levels of fitness, tailoring more precisely for age and providing “more details on the various [sic] cancer treatments and possible effects”. Suggestions also included using the “best bits” of the website into a mobile app or combining the program with a face-to-face group.



## Discussion

The results of this study indicated that website architecture of Prostate Cancer Health and Fitness online (PCHF) somewhat impacted behavioural engagement between the intervention arms. Examining the primary outcome (physical activity log engagement) alone would have suggested that the standard tunnelled condition was relatively more successful in engagement and reported slightly higher on usability than the other conditions. However, both intervention arms accessed roughly 60% of the total available intervention components (4 physical activity logs + 4 ‘once off’ advice modules), yet, each arm accessed different aspects of the website. This difference could be explained by participants in the free choice arm had an additional barrier to using the physical activity logs, as they were a separate click and not embedded within the same weekly module. Alternatively, another way of thinking about the free choice arm’s online engagement behaviour is that, when given the choice, participants appeared to have a ‘grab the information and go’ approach to the information that is easily accessible, and were not interested in returning to the website to track their activity.

Instead of the physical activity logs, free choice participants were more likely to click on all the ‘once off messages’ and therefore were exposed to the social support strategies and habit formation messages more than the tunnelled group. Therefore, participants in the free choice arm had an increased exposure to health messages based on Habit Theory (32) and Social Cognitive Theory (31, 33). However, this exposure was at the expense of self-monitoring and weekly goal setting over time, which targeted self-efficacy, and is an aspect considered to important for behaviour change (31, 33). The standard tunnelled group, in contrast, had the same issue but in reverse. Tunnelled participants had more exposure to self-monitoring, which was at the expense of exposure to other theoretical strategies presented in weeks three and four of the program, due to non-usage attrition.

The module usage difference between groups indicates a potential trade off effect. Trade off effects have been noted in previous website architectural experiments (23, 28). However, the trade off in PCHF was not that of behaviour as a result of exposure, like in previous studies (23, 28), but rather a comparison of the types of information access when given the choice. When given the choice, most participants

went for information that was ‘once off’ in nature and did not require repeat website visits. This is an important finding, as it might mean that future studies may need be creative with self-monitoring components within computer-tailored interventions in order to be both autonomy promoting and efficacious. To gain a better understanding of the impact of engagement with certain computer-tailored website features over others, future research is needed to examine how certain combinations of behaviour change techniques might impact behaviour (47). In this case, how module engagement relates to changes in mechanisms of action (i.e., exposure to behaviour change techniques, changes in social support, changes in self-efficacy), and therefore efficacy (14).

Interestingly, regardless of website architecture, many participants in PCHF did not return to the website to track their behaviour using the physical activity logs. This might be because behaviour tracking via the website was an environmental barrier, as participants were required to hand log their behaviour over the week and remember to log into the website to enter the data. To overcome this, potentially adding wearable trackers to the program could influence the perception and engagement of physical activity tracking within an online program. Previous computer-tailored research has already shown that engagement for a computer-tailored physical activity program was improved in those participants who used a combination of wearable trackers in a tunnelled computer-tailored program, see Vandelanotte et al. (2018) (48). In fact, research into wearable trackers in cancer populations is gaining traction (7, 8, 49), and has been found acceptable (50) and valid (51) in prostate cancer populations. However, simply giving prostate cancer survivors a wearable tracker to use would unlikely to be a ‘silver bullet’ to meet physical activity and behaviour change needs (52). Current wearable trackers are disease non-specific, and therefore adaption (52), or prescription (53) may be required. It is recommended that further research explore the use of wearable moment-to-moment behavioural tracking with different forms of computer-tailored website architecture. For example, examining standard tunnel vs. free choice + tracker, or computer with wearable trackers in both standard tunnelled vs. free choice.

Overall, the secondary data in this study was neither sufficiently powered nor definitive, due to lack of and highly variable data. However, the website architecture may have influenced a few other key study elements. For example, both the control group and the free choice group reported slightly higher satisfaction scores than the

tunnelled group. The free choice arm certainly allowed more autonomy within the website. So too did the control group, when compared to the tunnelled arm. Interestingly, both free choice and control group increased their MVPA scores more than the tunnelled arm. These differences could potentially relate to participants need for autonomy being supported via access to more control between the participant and their interactions within the website (21), however more statistical power would be needed to investigate if this indeed is the case. Overall, the usability data suggests that the website architecture was not an issue, but rather the program's visual appeal required further input to change the layout to be more 'user friendly'. Participants' qualitative feedback indicated a need for the content to be more specific. For example, tailoring more precisely for age, providing a broader range of specific activities, or have more definitive advice, rather than general health promotion advice. This was counter to the initial design, as the messages were written in more autonomy promoting language in an attempt to provide opportunities for participants to think and apply their own behavioural strategies.

In these circumstances, allowing participants to self-tailor did not influence the relevancy score between groups. This was a fundamental lesson learnt from PCHF. That is, those participants that influenced the design of PCHF (qualitative investigations) were *not* the participants who actually signed up for the program via community engagement and social media advertisement uptake. During the design of PCHF, qualitative input was used to support the design of PCHF, as per digital design recommendations (20). This involved interviews with 16 prostate cancer survivors with mixed levels of educational backgrounds, comorbidities, and different levels of physical activity behaviour. The program's content was written to reflect this, alongside input from behavioural science and exercise physiology. However, the participants of this study had higher baseline levels of education and aerobic physical activity than anticipated. This was because the eligibility screening process was based on participants not meeting the guidelines (both aerobic and resistance training requirements). Therefore, most participants entered the study based on a lack of resistance training and were already highly aerobically active, biasing the sample.

On the whole, the computer-tailored content may still be of value, despite the control group changing their behaviour, potentially as a result of exposure to Australian

cancer websites in this study that included information on resistance training. Control participants felt that their arm's content was "underwhelming" and that they continued with their "own routine". In contrast, the overall qualitative feedback from the tailored intervention arms of PCHF perceived the intervention as something worthwhile but required improvement. Finally, there was a broader, more clinical point raised by participants in the qualitative feedback. Several participants mentioned that they wanted a program for their 'sexual fitness' not just their physical fitness. This might relate to how previous clinical exploration has noted that 'exercise' can be used as draw card, due to its fit within masculine ideas and that men are 'doing something' about their prostate cancer (54, 55). This draw card could be used to then approach multiple cancer supportive care needs, such as diet, exercise, mental health etc. (56, 57). Multiple behavioural change studies are growing in the behavioural field, as human behaviour is seldom in isolation (57-60). However, there has been little so far to support multiple behaviour change computer-tailored interventions in prostate cancer (7), and more research is required in order to think around prostate cancer survivors in a more holistic manner.

### *Strengths and Limitations*

The study was supported by a strong methodology using a randomised controlled trial methodology. Participants were blinded to the main outcome of the study, and the objective website data for the primary outcome was available for 100% of all individuals who received their allocated intervention. The intervention design was evidence based, rigorous, and was grounded in behaviour change theory. Furthermore, unlike other website architecture experiments (24, 58), computer tailoring was present for both intervention arms. This placed the study emphasis on the website architecture, rather than the tailoring itself. However, there are a few study limitations to consider. A limitation to consider was that given that the physical activity logs were an extra 'click' for the free choice participants, as it was not embedded within the main module rather than participant interest, therefore the findings of the primary outcome should be considered with caution.

Of those participants who completed the screening eligibility tool, 49% enrolled in the study, which is higher than (7, 59) or comparable to (8) other studies in this field.

However, the overall clicks to the screening tool to actual screening completion were poor (N=156/411). Once enrolled, PCHF had a study retention rate of 64% of all participants randomised (N=50/78), and 70% of those who received their allocated intervention (N=50/71). This is similar to Kenfield's recent behaviour change prostate cancer study (7), but lower than other prostate cancer online studies (8, 10). Even though the recruitment period was doubled in time, the study did not reach the recruitment target, similar to issues noted in other men's health research (60, 61). This indicates a major feasibility issue, and limits the ability to discern differences, particularly in secondary outcomes.

While a lack of objective measures for secondary outcomes, such as physical activity was a limitation, the length of the program was sufficient to collect objective data regarding the differences in online engagement between the intervention groups. Another limitation of this study was that the participants were able to enrol in this study if they were not meeting *both* components of the oncology exercise guidelines (4). Furthermore, some participants may have said they were not meeting the guidelines at the screening process, but then reporting meeting the guidelines during the baseline survey. This resulted in aerobically active participants who were meeting aerobic guidelines at baseline and therefore biased the sample, impacting on perceived content and engagement. In PCHF, funding and timing was restricted based on a PhD program. Nevertheless, the study was able to gain a broad national sample with participants from all Australian states and territories. Despite the lack of power, this study was still able to identify significant differences in the main outcome. Future prostate cancer studies could utilise additional recruitment avenues, such as the use of cancer registries or extending the recruitment deadline.

## Conclusion

The website architecture of computer-tailored intervention is likely to impact the online engagement. Further research is required to improve relevancy, and to explore links between website architecture, engagement and efficacy. Exploration of wearable trackers alongside different website architecture experiments within computer-tailored interventions to support the physical activity and supportive care needs of prostate cancer survivors is recommended.

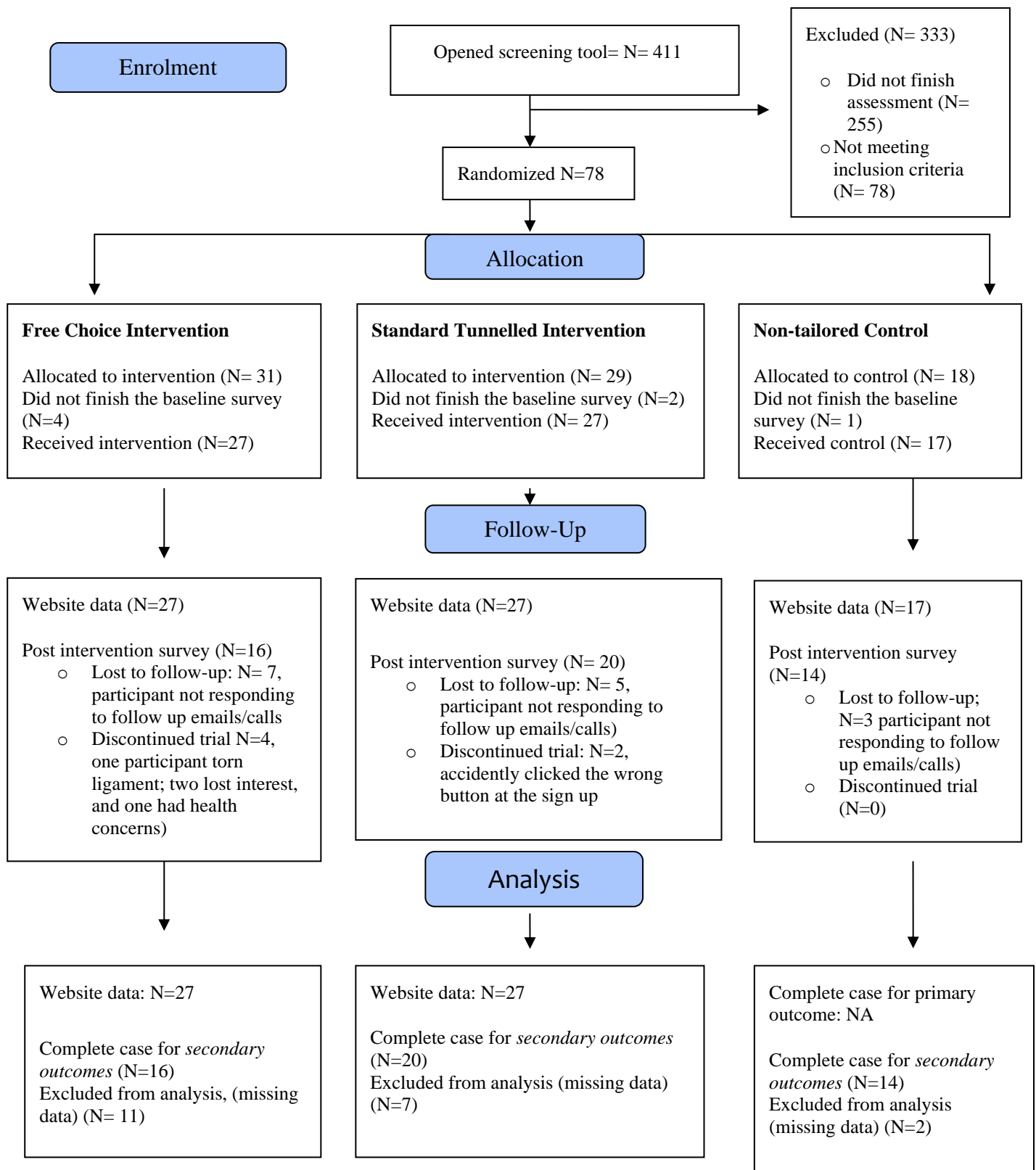


Figure 1: Participant Flow Chart

Table 1: PCHF intervention modules and additional features

<b>Module Name+ Social Cognitive Theory (SCT)</b>	<b>Behaviour Change Techniques</b>	<b>Primary Intervention Component Aim</b>	<b>Tailoring Variables</b>
Module 1:  Getting started          SCT: Knowledge, Self-efficacy, Outcome Expectations	Provide information on consequences of behaviour in general; Provide information on consequences of behaviour to the individual, provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice.	Introduction to physical activity and the program; increase knowledge and the outcome expectations of participants; highlight benefits of activity for prostate cancer; promote the guidelines for cancer survivors; tailored information regarding internal or external motivation; tailored promotion of the guidelines for older adults (over 65 years) or general adults (under 65 years).	Age/ intrinsic and extrinsic motivation/ health functional status with comorbidities
Physical Activity Log Week 1	Prompt self-monitoring of behaviour and outcome, provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice. Provide feedback on	Tailored feedback of current activity compared to guidelines using graphs. If no activity, then encouragement to begin (no graphs compared to guidelines). Suggest setting a general goal for the following week and links to library section of	Aerobic activity/ Resistance training/ days active/ goal met/ satisfied with goal

<b>Module Name+ Social Cognitive Theory (SCT)</b>	<b>Behaviour Change Techniques</b>	<b>Primary Intervention Component Aim</b>	<b>Tailoring Variables</b>
	performance. Prompt review of behavioural goals	the website for examples of exercises.	
Module 2: Making goals and overcoming barriers  SCT: Knowledge, Facilitators/ Impediments	Prompt barrier identification, provide instruction, prompt specific goal setting, prompt review of behavioural goals, set graded tasks, teach to use prompts/cues.	To learn about goal setting; tips on goal setting (basic and advance goal setting with optional print out); tailored advice on the biggest barrier faced when getting active;	Barriers / Goal setting approaches
Physical Activity Log Week 2	Prompt self-monitoring of behaviour and outcome, provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice. Provide feedback on performance. Prompt review of behavioural goals	Tailored advice regarding the general goal set for the previous week; tailored feedback of baseline and week 1 compared to guidelines using graphs. Suggest setting a general goal for the following week and links to library section of the website for examples of exercises.	Aerobic activity/ Resistance training/ days active/ goal met/ satisfied with goal



<b>Module Name+ Social Cognitive Theory (SCT)</b>	<b>Behaviour Change Techniques</b>	<b>Primary Intervention Component Aim</b>	<b>Tailoring Variables</b>
Module 3: Lone ranger or socialite? Exercising with others  SCT: Planning social support, Facilitators/ Impediments	Provide instruction, plan social support/social change, model or demonstrate the behaviour, provide general information, Provide general encouragement.	Tailored advice provided to men regarding their preferences for social support; advice to assess if they are happy with the level of support that they receive and provide appropriate advice.	Social preference/  Satisfaction with support
Physical Activity Log Week 3	Prompt self-monitoring of behaviour and outcome, provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice. Provide feedback on performance. Prompt review of behavioural goals	Tailored feedback of baseline and week 1, week 2 compared to guidelines using graphs. Suggest setting a general goal for the following week and links to library section of the website for examples of exercises.	Aerobic activity/ Resistance training/ days active/ goal met/ satisfied with goal

<b>Module Name+ Social Cognitive Theory (SCT)</b>	<b>Behaviour Change Techniques</b>	<b>Primary Intervention Component Aim</b>	<b>Tailoring Variables</b>
Module 4: Making long term changes  SCT: Relapse prevention, Facilitators/ Impediments	Provide general encouragement, relapse prevention, prompt review of behavioural goals, provide instruction.	Tailored advice occupational based variable (labouring/ desk job/ no job) to advice if participants assume that they are getting enough exercise based on their job status, tailored advice regarding perception of routine, to learn about habit formation, Administration of autonomy scale, and recommendations for those who are self- motivated (intrinsic motivation) and tips for externally motivated individuals.	Incidental activity / level of automatic motivation for Physical activity behavioural
Physical Activity Log Week 4	Prompt self-monitoring of behaviour and outcome, provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice. Provide	Tailored feedback of baseline and week 1, week 2, and week 3 compared to guidelines using graphs. Suggest setting a general goal and to make the last week of the intervention 'count' Suggest setting a general goal for the	Aerobic activity/ Resistance training/ days active/ goal met/ satisfied with goal/ intrinsic or external

<b>Module Name+ Social Cognitive Theory (SCT)</b>	<b>Behaviour Change Techniques</b>	<b>Primary Intervention Component Aim</b>	<b>Tailoring Variables</b>
	feedback on performance. Prompt review of behavioural goals	following week and links to library section of the website for examples of exercises. Reminders to come back to finish the final survey.	Motivation and autonomy
Additional website features			
Provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice Use of follow-up prompts		Library: contains video links to demonstration resistance training exercises (with and without a resistance band). Links to static articles at both a general reading and advanced reading, links to pod casts about prostate cancer, links to all barrier related advice. Links to print out demonstration pages of male-based exercises vetted by our exercise physiologist.	
Provision of instruction on behaviour, modelling/demonstration of behaviour/ provision instruction on how to perform the behaviour, prompt practice Use of follow-up prompts  Use of follow-up prompts		Email capacity to a clinical exercise physiologist in our “Ask an Expert”, offered free advice and to adherence to the recently released Australian guidelines for oncology clinical support during exercise (65). Frequently asked emails were to be released as video responses so that all other men could benefit from the questions and answers	

Table 2: Participant Characteristics (complete baseline data N=71)

Characteristic		<b>Standard Tunnel</b> N= 27	<b>Free choice</b> N=27	<b>Control Arm</b> N=17	<b>Total = 71</b>
Age	Range (years)	55-91	50-79	38-79	38-91
	Mean (SD)	68.9 (9.8)	64.9 (9.3)	65.5 (9.8)	66.6 (9.6)
Education	Post Grad	6 (22.2%)	4 (14.8%)	2 (11.8%)	12 (16.9%)
	University	9 (33.3%)	8 (29.6%)	9 (52.9%)	26 (36.6%)
	Trade / diploma	7 (25.9%)	7 (25.9%)	4 (23.5%)	18 (25.3%)
	High school	5 (18.5%)	8 (29.6%)	2 (11.8%)	15 (21.2%)
Marital status	Married/partner	23 (85.2%)	24 (88.9%)	13 (76.4%)	60 (84.5%)
	Separated/single	4 (14.8%)	3 (11.1%)	4 (23.6%)	11 (15.5%)
Employment	Full time	5 (18.5%)	8 (29.6%)	3 (17.6%)	16 (22.5%)
	Part time/causal	1 (3.7%)	4 (14.8%)	0 (0%)	5 (7.1%)
	Self employed	4 (14.8%)	2 (7.4%)	1 (5.9%)	7 (9.8%)
	Retired	15 (55.6%)	12 (44.4%)	11 (64.7%)	38 (53.5%)
	Other	4 (5.6%)	1 (3.7%)	0 (0.0%)	5 (7.1%)
Location	Major city	15 (55.6%)	13 (48.1%)	7 (41.2%)	35 (45.5%)
	Inner regional	7 (25.9%)	10 (37.0%)	4 (23.5%)	21 (27.3%)
	Outer regional	4 (14.8%)	2 (7.4%)	6 (35.3%)	12 (15.6%)

	Remote	1 (3.7%)	2 (7.4%)	0 (0.0%)	3 (3.9%)
Cancer stage	Stage 1	4 (14.8%)	2 (7.4%)	3 (17.6%)	9 (11.7%)
	Stage 2	12 (44.4%)	9 (33.3%)	4 (23.5%)	25 (32.5%)
	Stage 3	10 (37.0%)	16 (59.3%)	9 (52.9%)	35 (45.5%)
	Unknown	1 (3.7%)	0 (0.0%)	1 (5.9%)	2 (2.6%)
Characteristic		<b>Standard Tunnel</b> N= 27	<b>Free choice</b> N=27	<b>Control Arm</b> N=17	<b>Total 71 Complete case baseline data available</b>
Cancer treatment†	Surgery	25 (92.5%)	19 (70.4%)	14 (82.3%)	56 (78.8%)
	Active	1 (3.7%)	1 (3.7%)	3 (17.6%)	5 (7.0%)
	Surveillance	11 (40.7%)	9 (33.3%)	5 (29.4%)	25 (35.2%)
	Radiotherapy	5 (18.5%)	4 (15%)	3 (17.6%)	12 (16.9%)
	Hormone	0 (0%)	1 (3.7%)	0 (0%)	1 (1.4%)
	Other				
Incontinence surgery	No procedure	25 (92.6%)	26 (96.3%)	14 (82.4%)	65 (91.5%)
	Procedure	2 (7.4%)	1 (3.7%)	3 (17.6%)	6 (8.5%)
Time since treatment (years)	Range	0.08 - 13	0.08- 10	0.17- 8	0.08-13
	Means (SD)	3.5 (3.75)	2.7 (2.6)	2.3 (2.34)	2.9 (3.0)

Time since diagnosis (years)	Range Mean (SD)	1-16 6.25 (4.15)	1-12 4.18 (3.4)	1-19 4.5(4.7)	1-19 5.1 (4.4)
BMI	Range Mean	17-35 26.3 (4.6)	21-349 28.4(3.97)	22-33 26.7 (3.17)	17-39 27.2 (0.41)
Co-morbidities (N %)	No issues 1 2 3 or more	2 (7.7%) 9 (34.6%) 9 (34.6%) 6 (22.2%)	5 (18.5%) 8 (29.6%) 8 (29.6%) 6 (22.2%)	5 (29.4%) 2 (11.8%) 6 (35.3%) 4 (23.4%)	12 (16.9%) 19 (26.8%) 23 (32.4%) 17 (23.9%)

† Participants may have indicated multiple cancer treatment and% will not add up to 100%

Table 3: Engagement, acceptability and usability (N=50)

<i>Measure Range</i>	<i>Data Set</i>	<i>Free choice Min Max (M, SD)</i>	<i>Standard Tunnelled Min Max (M, SD)</i>	<i>Control Min Max (M, SD)</i>	<i>P-value</i>	<i>Adjusted p-value</i>
E-health Engagement Scale (1-5)	Complete Case	1-4 2.2 (0.94)	1-4 2.2 (0.93)	1-4 2.2 (0.87)	.8	.4
	Imputed	1-4 2.27 (0.6)	1-4.3 2.32 (0.8)	1-4 2.4 (0.1)	.9	.9
SUS- Usability (10-100)	Complete Case	40-82.5 56.4 (12.2)	40-95 67.4 (14.6)	15-85 57.4 (17.5)	.06	.06
	Imputed	40-95 59.9 (10.2)	40-95 66.7 (12.5)	15-85 8.97 (16.0)	.07	.4
Client Satisfaction Scale (CSQ) (8-36)	Complete Case	8-25 17.5 (5.3)	8-30 14.9 (8.3)	8-27 17.3 (6.5)	.4	.5
	Imputed	8-25 17.4 (4.0)	8-30 15.4 (7.16)	8-27 17.23 (5.9)	.4	.6
Average perceived relevance (1 – 5)	Complete Case	1-4 2.4 (1.1)	1-4.3 2.7 (1.2)	1-4 2.4 (1.3)	.4	.6
	Imputed	1-4.3 2.6 (1.0)	1-4.3 2.8 (1.1)	1-4 2.5 (1.2)	.6	.7

Table 4: Physical activity outcomes

Moderate-Vigorous Physical Activity (MVPA) aerobic minutes per week		<i>Baseline Min-Max Mean (SD)</i>	<i>Follow up Min-Max Mean (SD)</i>	<i>Difference Min-Max Mean (SD)</i>	<i>Non-parametric test between trial arms and physical activity</i>
Free choice	Complete case, N=16	0-900 226.3 (252.4)	0-900 280.62 (221.7)	-600 to 820 +54.37 (326.7)	<b>Complete case</b> Post MVPA score H(1)=. 2.7 p= .100 MVPA difference pre/post H(1)=. 84, p= .31
	Imputed, N=27	0-900 205 (239.7)	0-900 237.41 (226.4)	-600 to 820 32.2 (249.6)	
Standard tunnel	Complete case, N=20	0-660 232.5 (186.6)	0-900 230.50 (199.9)	-380 to 620 -2 (267.5)	<b>Imputed data (N=71)</b> Post MVPA scores H(2)=.3.91 , p= .14 MVPA difference pre/post H(2)=.2.9, p=.23
	Imputed, N=27	0-660 217.037 (187.3)	0-780 215.56 (196.9)	-380 to 620 -1.48 (228.3)	
Control	Complete case, N=14	0-900 292.1 (283.8)	40-900 387.14 (213.3)	-690 to 420 +95 (317.6)	
	Imputed, N=17	0-900 252.35 (272)	0-900 330 (232.4)	-690 to 820 78.23 (288.7)	



<b>Resistance training</b>		<i>Baseline Min-Max Mean (SD)</i>	<i>Follow up Min-Max Mean (SD)</i>	<i>Difference Min-Max Mean (SD)</i>	<i>Non-parametric tests between trial arms and physical activity</i>
Free choice	Complete case, N=16	0-150 20 (43.9)	0-100 22.5 (32.2)	-150 to 100 +2.5 (60.5)	<b>Complete case</b> Post resistance score H(1)=.22, p= .64 Resistance difference pre/post H(1)=.35, p=.56
	Imputed, N=27	0-150 13.11 (34.7)	1-100 16.074 (26.8)	150 to 100 +2.96 (46.5)	
Standard tunnel	Complete case, N=20	0-150 11.7 (33.8)	0-210 23.4 (47.9)	-150 to 210 +11.75 (SD 62.1)	<b>Imputed data</b> Post resistance score H(2)=.47, p= .74 Resistance difference pre/post H(2)= .27, p= . 87
	Imputed, N=27	0-150 10.17 (29.9)	0-210 21.77 (44.74)	-150 to 210 +11.53 (54.3)	
Control	Complete case, N=14	0-21 2.4 (5.7)	0-75 19.1 (26.7)	-15 to 12 +16.71 (SD 28.5)	
	Imputed, N=17	0-21 2.58 (5.6)	0-75 18.7 (26.2)	-15 to 75 +16.11 (26.9)	

Table 5: Meeting the physical activity guidelines

Meeting the Guidelines = 150min of MVPA + 2 sessions or more of resistance training		Baseline X/N (%)	Follow up X/N (%)	Difference	Statistical tests
Free choice	Complete case, N=16	3/16 (18.8%)	7/16 (43.7%)	+24.9%	<b>Case Completers:</b> Post intervention $\chi^2(2, N=50)=1.02, p=.6$ Binomial logistic regression <i>Step 1 model:</i> $\chi^2(21, N=50) = 18.98 p=.59$ Nagelkerke = .42, predictors: higher education, lower number of comorbidities ( $p<0.05$ )
	Imputed, N=27	5/27 (18.5%)	8/27 (29.6%)	+11.1%	
Standard tunnel	Complete case, N=20	6/20 (30.0%)	8/20 (50%)	+20%	
	Imputed, N=27	7/27 (25.9%)	9/27 (33.3%)	+7.4%	
Control	Complete case, N=14	3/14 (21.4%)	8/14 (57.1%)	+35.6%	<b>Imputed Data:</b> Post Intervention $\chi^2(2, N=71) = 2.645, p=.27$ Binomial logistic regressions* <i>Step 1 model:</i> $\chi^2(2, N=71) = 2.6, p=.27$ Nagelkerke = .47, Associated predictors: meeting guidelines at baseline
	Imputed, N=17	4/17 (23.5%)	8/17 (47.1%)	+23.6%	

\*Predictors in binomial regression model= age, location, education, work status, time-since treatment, number of co-morbidities and meeting the guidelines at baseline

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## Supplementary Document 1

### *Participant Screening Questionnaire for PCHF*

What is your first name?

What's your email address or phone number?

How did you hear about this study?

1. GP
2. Urologist /oncologist
3. Prostate cancer nurse
4. Allied health (physio, podiatrist) etc.
5. Support group
6. Friend / family / partner
7. South Australian Health and Medical Research Institute (SAHMRI)
8. Men's Health Registry
9. Pathfinders (Prostate Cancer Foundation Australia)
10. Social media (Facebook / Instagram)
11. Church
12. Rotary / Lions / RSL/ Community groups
13. SA-PCCOC (South Australian Prostate Cancer Registry)
14. Spanner in the Works
15. Other: \_\_\_\_\_

### **Cancer Screening**

Have you completed all your cancer treatments (radiotherapy, surgery, brachytherapy, etc.)

- ☐ AND are considered to be in remission?
- ☐ AND you DO NOT have metastatic disease

\*If you are currently on hormone treatment as a secondary treatment (e.g. after surgery or after radiation treatment) but are considered to be in remission that is ok and please click yes. If you are unsure, please call Amy Finlay on 08 8128 4056

YES

NO

Are you 18 years old or over?

YES

NO

### Aerobic / cardio activity

**Remember that below are just examples, everyone's level of fitness impacts when they might feel puffed out.**

Moderate Activity	Vigorous Activity
<p>This type of activity gets your heart rate up a bit. You can talk but you couldn't sing.</p> <ul style="list-style-type: none"><li>• Walking as if you were late for an appointment (brisk walking)</li><li>• Dancing, playing games with children</li><li>• Gardening, light digging, planting, weeding</li><li>• Walking the dog, or other animals</li><li>• Household tasks, washing windows, mopping floors</li><li>• Lawn mowing with a powered lawn mower</li><li>• Gentle swimming</li></ul>	<p>This type of activity makes you start huffing and puffing pretty quickly. You can only say short words at a time.</p> <ul style="list-style-type: none"><li>• Gardening where you're lifting, digging and shovelling,</li><li>• Wheel burrowing or pulling down heavy branches and mulching,</li><li>• Fast walking</li><li>• Moderate-fast swimming</li><li>• Skipping</li><li>• Going up hills / hiking</li><li>• Basketball</li><li>• Quick cycling</li><li>• Aerobics</li><li>• Jogging / fast walking</li></ul>

**How much moderate-vigorous physical activity are you doing on average per week? Please select one**

- ☐ More than 150 minutes (2.5 hours) per week
- ☐ Less than 150 mins (2.5 hours) per week

### Strength training

Are you doing **2 or more sessions** of strength training per week at the moment?

YES

NO

Can you comfortably speak and read the English language?

YES

NO

Do you have easy access to a laptop, computer, tablet or smartphone **with Internet access?**

Fast enough for YouTube video content?

YES

NO

### **Physical Activity Readiness Questionnaire**

The following questions are to detect any problems with your health that may affect your ability to become more active. Only those whose health allows them to safely become more active are eligible to participate in the program.

<i>Questions</i>	<i>Yes</i>	<i>No</i>
Do you have any condition(s) that may prevent you from increasing your physical activity?		
Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor		
Do you feel pain in your chest when you do physical activity?		
In the past month, have you had chest pain when you were not doing physical activity?		
Do you lose your balance because of dizziness or do you lose consciousness?		
Do you have a bone or joint problem that could be made worse by a change in your physical activity?		
Is your doctor currently prescribing drugs for your blood pressure or heart condition?		
Do you know of any other reason why you should not do any physical activity?		

**Please indicate your status.**

Did you answer "yes" to any of the above health questions? If you did- we will ask that you seek medical advice from a GP/ Urologist/ Oncologist before participating in this study.

Choose an option

- ☐ I do not need a doctor clearance: I clicked "no" to all questions
- ☐ My doctor has cleared me I need to speak to a doctor
- ☐ I will need to talk to my doctor

**Project title: Prostate Cancer Health and Fitness online**

**Ethics number: H 2017-101**

**I agree that I am providing informed consent to participate in this project.**

- I have read the Information Sheet provided for me at the beginning of the project and agree to take part in the following research project
  - I have had the project, so far as it affects me, fully explained to my satisfaction by the research worker.
  - My consent is given freely although I understand that the purpose of this research prostate is to improve the quality and availability of cancer rehabilitation resources, it has also been explained that my involvement may not be of any benefit to me.
  - I have been informed that, while information gained during the study may be published, I will not be identified, and my personal results will not be divulged.
  - I understand that I am free to withdraw from the project at any time.
- 
- I Agree
  - I Disagree

NOTE: This is an experimental program- participants are randomized into standard care or into an intervention group. Those in standard care will be able to have access to the full program after 4 weeks.

Feel free to access the participant information sheet by clicking [here](#) again if you need to re-read about the project

## ***Chapter 6***

### **Thesis Discussion and Conclusion**

## Thesis Discussion

### *Summary of Thesis Findings*

This thesis contained the systematic development and trial of two computer-tailored interventions marketed as Prostate Cancer Health and Fitness online (PCHF). To recapitulate, PCHF was designed using a multifaceted approach. A systematic appraisal of the literature (1) (see Chapter 2) was the first component of the intervention design process. The review aimed to provide a comprehensive synthesis of physical activity behaviour change trials targeting prostate cancer survivors, assess their feasibility and efficacy, and, if possible, to identify intervention and study characteristics associated with significant intervention effects. The review identified six prostate cancer and six mixed cancer studies that focused on physical activity behaviour change. Five prostate cancer and three mixed-cancer interventions were successful at increasing the physical activity of the participants compared to the control. While the review was able to provide an overview of previous literature, it was unable to determine distinct intervention efficacious factors due to the heterogeneity and limited number of available studies. The first thesis aim was to identify efficacious factors of previous physical activity behaviour change programs targeting men with prostate cancer and identify strategies to support behaviour change. Unfortunately, there was very little guidance in the literature as to how to approach online behavioural interventions for prostate cancer survivors from the systematic review, given that there was only one online study at the time of data extraction. This is where the findings of the qualitative investigations (Chapters 3 and 4) were able to ‘fill in’ some of the gaps within the prostate cancer and online behavioural literature.

Following a person-based approach to intervention development (2), the second aim of the thesis was to use qualitative investigations to identify opportunities for tailoring and identify participant preferences for the website design. This included a health message feedback study (Chapter 3) and an interview study (Chapter 4). Both studies contained the same sixteen prostate cancer survivors (mean age = 71.1 years, SD  $\pm$ 7.1, mean time since last treatment = 5.1 years, SD  $\pm$  4.6). The health message feedback study sought written feedback on four health promotion messages based on key

determinants outlined by Social Cognitive Theory (3). The feedback was designed to identify components of the message that were not relevant. This guided the PCHF program tailoring efforts. For example, overall, participants did not take issue with the message explaining the general benefits of increased participation in physical activity. Therefore, future programs using messages indicating the ‘benefit’ of increasing activity would likely not need tailoring. However, the results indicated that any message that gave information that could be perceived as ‘advice’ to an individual would require tailoring. Individualised advice pertaining to approaches to goal setting, action planning, and use of social support is recommended, based on participant preferences. The exercise examples provided in the messages did not take into account the severity of their co-morbidities, such as severe arthritis, or baseline fitness levels. The examples provided in PCHF were therefore framed to explain the difference in levels of physical activity intensity based that was on relative experience (e.g., exhaustion level), rather than specific activities (e.g., jogging). The results of this health message feedback study also indicated that the message presentation within the program would need to be short, simple and easy to follow, similar to recommendations of other digital based literature (2, 4, 5). The tone and language used was mostly acceptable, however two participants specifically mentioned that the tone was too authoritative. Integrating this into the design of PCHF, the messages were more suggestive and less prescriptive in tone, following a suggestion in previous computer tailoring literature (6).

While the health message feedback study was used for tailoring guidance, the interview study (Chapter 4) was primarily to gather more in-depth information to support the development of PCHF. Specifically, this study aimed to gain a greater understanding of prostate cancer survivors by exploring their perceptions of their cancer experience, as well as their opinion and preferences regarding physical activity and online intervention features. Similar to previous findings (7-9), physical activity was valued by participants post treatment, likely reflecting traditional masculine ideas of strength and control (10). However, barriers such as pain, comorbidities like arthritis or incontinence, as well as self-motivation, were said to impact their exercise participation. These outcomes were similar to previous findings (11-14). Overall, the participants in this interview study were open to online lifestyle support, particularly those of higher education and who used technology and the Internet on a daily basis. This might reflect



the growing uptake of technology amongst older Australians (15), though there were access issues indicated by several rural participants (16-18).

In summary, the majority of prostate cancer survivors in the interview study valued their health and were interested in physical activity, though perhaps could not participate due to barriers and would therefore require support. Most participants used the Internet, had access to technology and would prefer a tailored program that provides concise, short and simple information. However, there were mixed points of view in terms of *how* a hypothetical online program should be delivered if choosing between a free choice or standard tunnelled program design. Eleven of the 16 participants wanted to “have an element of choice”, one participant was unsure about whether a free choice version or a standard tunnelled version would be best, and four participants with lower education wanted a more ridged and step-by-step approach. Given that there were mixed preferences in how the website program should be delivered, the opportunity to experiment with the website architecture seemed fitting. Taken together, the findings from the systematic review, the qualitative investigations, along with intensive workshopping with a behavioural scientist (CES) and an exercise physiologist (HE) resulted in the Prostate Cancer Health and Fitness online (PCHF) program. The program was informed by theoretical content based on Social Cognitive Theory, mapped to pre-specified behaviour change techniques (19).

As noted in previous literature, tailoring is a superior option compared to non-tailored messaging within health promotion and behaviour change research (4, 6, 21, 22). However, comparing website architecture has had little attention to date (20), with no studies neither directly comparing tailored arms, nor the impact of the different architectures on behavioural engagement. Rather than exploring the impact of the architecture, previous website architecture experiments which compared a tailored arm vs. a static free choice control was more to be contributing to the demonstration of the superior effects of tailoring (23, 24). Arguably, only one study has had computer tailoring in each arm of the website architecture (and with a control), however this was on recall knowledge on hepatitis, and not on behavioural outcomes or participant engagement (25). Therefore, the exploration of website architecture on behaviour within computer-tailored settings has not been directly compared to date (20, 26).

PCHF was the first randomised controlled trial to directly compare two different versions of the same computer-tailored interventions on behavioural engagement outcomes. The aim of PCHF randomised controlled trial was to evaluate differences in engagement, acceptability, and preliminary efficacy between a free choice computer-tailored intervention, a standard tunnelled computer-tailored intervention and a non-tailored control. The results of the trial were able to identify that the online behavioural engagement between the prostate cancer survivor participants and the program was somewhat influenced by online website architecture. Participants in the free choice of the website were more likely to engage with the ‘once off’ tailored health advice but were less likely to use the physical activity behavioural tracking which required repeat logins over time. In contrast, standard tunnel participants were more likely to complete the physical activity logs but were less likely to have been exposed to messages presented later in the program. While the standard tunnelled condition overall used the physical activity logs more than the free choice group, very few participants actually complete the program. The non-usage attrition rate in PCHF was consistent with previous online literature (27-30). Secondary outcomes were less informative, as there were little differences between included differences in perceived website usage and relevance. However, the randomised controlled trial was not powered to detect statistical differences the additional secondary outcomes.

### Thesis Hypotheses

There were no hypotheses generated for the first two aims of this thesis as these studies were exploratory in nature and focused on intervention development. The hypotheses for this thesis were in relation to the randomised control trial of PCHF. For hypothesis one, we predicted that participants randomised to the free choice arm would have higher engagement in both behavioural engagement domains (number of physical activity modules completed) and affect-based (12-item e-health engagement) compared to participants in the standard tunnelled intervention arm. The hypothesis was not supported. While participants in the free choice arm were more likely to complete the ‘once off’ modules, they were also less likely to complete the physical activity tracking

modules. However, when looking at total volume of content accessed, there were no differences between the two groups or in affect-based engagement.

Hypothesis two predicted that a similar pattern of results favouring the free choice arm would be observed for all other study outcomes, with more favourable acceptability and behaviour change compared to the standard tunnelled arm. The null hypothesis was retained, as there were no differences detected between groups. As the trial was powered to detect differences in physical activity log use, it is unclear if the results for the secondary outcomes were limited by statistical power. The final hypothesis predicted that participants in both tailored intervention arms (free choice and tunnelled) would report more favourable intervention outcomes related to acceptability and behaviour change than the control arm. This final hypothesis was also not supported. The website acceptability and perceived relevance was moderate, though not different across groups. This indicated room for improvement in both website design and content. Participants in both the control condition and the free choice condition increased their aerobic activity, whereas those in the tunnelled group roughly maintained their levels. However, all arms were above the recommended 150min of moderate to vigorous minutes of activity per week at baseline, therefore biasing the study sample. Perhaps the men in the free choice group and the control group maintained their own fitness levels regardless of program interaction, and it is unclear why those in the standard tunnel maintained their level. Alternatively, it might have been because men were more in control of their online behaviour within the free choice and the control (usual care) arms compared to the standard tunnelled arm. However, limitations in the data set cannot determine this, as participants were not further probed within the post intervention survey to assess if this was the case. Perhaps a qualitative investigation post intervention may have aided the interpretation of the results.

### *Lessons Learned and Future Directions*

There are several lessons that this thesis has been able to highlight that are important to mention for future research. Participants in the preliminary qualitative studies, which influenced the design of Prostate Cancer Health and Fitness (PCHF), tended to be older

(56 years to 83 years, average 71 years), over 5 years from their diagnosis and treatment, reported low-moderate level of exercise, and had a broad range of education levels. Whereas those who signed up for the PCHF trial were younger (average age was 66 years), were broader in age (38 years to 91 years), were closer to their last treatment (2.2 years), were highly educated, and reported a high level of baseline activity. This resulted in a mismatch in the message content versus those who actually signed up for the program.

This discrepancy was noted in the relevancy data of the trial and could be explained in two possible ways. First, differences in the characteristics of individuals between each of the studies might be explained by the perceived participant burden between a qualitative interview and a randomised controlled trial. Therefore, this potentially impacted sample characteristics. Participant burden is a key ethical consideration in human trials (33). Participants who were older and less motivated for actual behaviour change may have perceived a lower subjective burden for a half an hour interview compared to being presented with a month-long physical activity intervention. Second, that the recruitment strategies differed between the intervention development studies and the PCHF trial. The qualitative study recruitment was primarily through the lead researcher personally promoting the studies in two local support groups. Whereas PCHF was much broader and more self-selected in its recruitment approach, using flyers, health practitioners (allied health and doctors), state and national research registries and social media advertisements. Self-selection into research studies is a known issue in health behaviour trials (34, 35). Thus, the recruitment bias of the PCHF intervention resulted in the program not meeting the intended target demographic and thus impacting the influence of the program. Potentially using co-design approach to intervention development, or perhaps ensuring the same recruitment strategies used for both studies may have identified the discrepancy between the intervention development characteristics and those who participated earlier on in the development process.

Recruitment based issues extended further than influencing the content relevance of PCHF. In general, male research recruitment is a challenge (36, 37) and the PCHF was no exception. The recruitment time period for PCHF had to be doubled from 3 months to 6 months, and still only met 60% of the target recruitment goal. In terms of lucrative recruitment methods, social media and support groups were critical to the PCHF trial.

Previous social media studies have suggested that recruitment uptake for older persons are poor (38). Yet the results from PCHF concur with a recent review (36) that explored recruitment strategies for older men and actually found social media to be fairly lucrative. This might be indicative of the increased use and competence with social media and the Internet by older adults in Australia (15). It should be noted that while social media can be an effective recruitment strategy (39-41), it could result in self-selection bias (42). In PCHF, the social media advertisements were likely to have enrolled highly motivated participants. To overcome the self-selection bias, future studies may need to invest resources into cancer registry approaches, as used in many previous behaviour change and prostate cancer studies (1) or utilise health practitioners. However, health practitioners are already required to cover a broad range of issues with a patient in a short period of consultation time (43, 44), and therefore a physical presence in clinical settings would be required to ease the burden on clinicians. Unfortunately, due to the budget and time restrictions on PCHF, these avenues were not an option, but could be utilised in future studies.

### *Computer-Tailored Intervention Future Directions*

Future computer-tailored and cancer behaviour change studies can learn from the PCHF project. The results from this project indicate that Internet behaviour and module engagement is guided, in part, by the architecture of the system. Participants were either more likely to access all of the ‘once off’ tailored content *or* be more likely to complete the physical activity logs over time but not both, dependent upon the structure of the website. Generally, in online studies, most standard tunnelled tailored programs spend considerable effort tempting participants to come back to log into the program. This usually includes reminders by texts, email, and /or calls, (45-49), or even financial incentives for daily logins (50). Despite these efforts, tailor programs have diminishing online logins, and very few participants finish the whole program (27, 45-49). For example, in a typical 8-week program, overall participant usage declines steadily across the weeks, starting from approximately 2-3 weeks into a program (27, 45-49). In this study, when given the choice, participants simply may not have *wanted* to use the website to monitor their behaviour and therefore did not return, as noted in the

discussion of the randomised control trial (see Chapter 5). Alternatively, this attrition may have been because participants were highly active at baseline, and therefore the desire for behaviour change was already being met, or that participants had other aspects in their life that reduced their capacity to participate, such as a lack of time, forgetting, or illness.

To save resources and effort when attempting to get participants back to the website for self-monitoring, perhaps a hybrid approach that combines a computer-tailored website with wearable trackers could be worth exploring (as noted Chapter 5). As noted in Chapter 5, a recent general population online computer-tailored study called TaylorActive tested this concept (51). The study found that those participants who had a wearable tracker were more likely to enact behaviour change compared to those without the wearable tracker (52). Furthermore, the participants with the tracker were more engaged (less non-usage attrition) and rated the program more favourably compared to the participants without a tracker (52). Overall, the usability and acceptability for wearable trackers in cancer populations shows promise (53-55), and one recent study reported that the wearable trackers had higher satisfaction compared to the study's prostate cancer and lifestyle website (90% vs 60%) (53). Efficacious at promoting behaviour change in themselves, (56, 57), combining a wearable tracker in a computer-tailored program might offer the capacity to give both the tailored disease content plus access to support behaviour change through mobile based, real time self-regulation.

Furthermore, wearable trackers have several advantages over self-reported behavioural monitoring via a computer-tailored website as per the conditions within PCHF. A wearable tracker automatically collects objective physical activity data, reduces the burden for self-monitoring via logging into the website, and reduces the likelihood of physical activity under or over estimation compared to self-reporting (51, 52). However, self-regulation over time can fail, particularly if the internalised individual goal is counter to the actual behaviour being monitored (58). That is, if a participant's internal goal or the goal /self-monitoring component, of an intervention is consistently out of reach, then long term behavioural monitoring ceases due to ego failure of the participant. Therefore, efficacious programs are likely to require more than simple self-monitoring. Programs would benefit from supporting other behavioural and theoretical determinants such as appropriate goal setting, action planning or use of

social support etc. (3, 19). Hence, a hybrid program that utilises the advantages of personalised support through a computer-tailored program alongside a wearable tracker for ongoing and iterative physical activity feedback would be worth further investigation.

On reflection, the development of content of the intervention could have benefited from more time working on with a broader range of prostate cancer survivors to assist content relevance. Future programs may benefit from integrating a ‘co-design’ approach to intervention development (59). Co-design is a process in which key stakeholders are not only consulted but are also ingratiated fully into every facet of the design process. This creates an intervention that has been refined through constant feedback over time and generates a more relevant intervention (59). Future computer-tailored studies should integrate user feedback and usability testing into their development strategies. This could assist tailoring, improve website usability and content relevancy. Thus, positively influence the intrinsic motivation of participants, leading to enhanced behavioural outcomes (60).

### *Exercise as a Gateway*

The PCHF qualitative feedback concurs with previous cancer-based studies (10, 61-69), in that future studies could potentially use physical activity as an ‘in’ to breach more sensitive cancer-based issues, such as mental health, or relationships and sexual intimacy. This might be because physical activity fits within masculine ideals of strength (65) and that men feel like they are ‘doing something’ about their cancer (65, 70). This opens the potential to explore multiple behavioural interventions, an aspect of health promotion that is growing in popularity (71-74) and has been used in previous prostate cancer interventions (1, 75-78). Multiple behavioural interventions view behaviour as a phenomenon that is not in isolation but a factor that interacts with other behaviours on multiple levels (71-74). However, there is a lack of consensus as to the best mechanism by which to promote and support multiple behaviour change interventions (71-74). In cancer, multiple behaviour change interventions have had some reported efficacious effects (1, 48, 75, 77). However, electronic and mobile health

research is still lacking in prostate cancer (37), with only one computer-tailored intervention looking into physical activity, diet and smoking (53). Future studies could explore and expand multiple behaviours within computer-tailored interventions targeting prostate cancer survivors to provide a more holistic approach to cancer care.

#### *Asking an Expert function- Needed or Not?*

In the PCHF program, only one of a possible 54 intervention participants submitted a question. Of those who commented on their non-usage, five participants said that they liked the option of an exercise physiologist on standby but did not feel the need use it. Two participants missed the feature and wish they had seen it, and one participant said that it was an important aspect of the program, but perhaps for “other men”. This lack of use could suggest that the men in this study (highly active and highly educated) may not have needed this feature. However, the recently published oncological guidelines for exercise state that cancer survivors should have clinical support from an exercise expert to instruct cancer survivors during, and post treatment to ensure the best physiological outcomes (79). Therefore an “Ask the expert” feature should not be dismissed but rather future programs could perhaps emphasise this feature. Perhaps by placing the option as pop up live chat, emailing participants to ‘check in with them’, or a placing a large button on home page. This could be important to support programs that have participants who have low self-efficacy in exercise or who have medical complications such as metastatic disease.

#### *Thesis Strengths and Limitations*

As noted by a recent systematic review, the field of online prostate cancer interventions are still in its infancy (37), with very few online prostate cancer and physical activity/ behaviour change studies (47, 50, 53). This thesis was therefore able to contribute to a growing and important field of research and was strengthened by the multifaceted and systematic development approach to intervention design. As per recommendations (2), the intervention development included examining the literature



and qualitative investigation for the design of Prostate Cancer Health and Fitness (PCHF). Furthermore, the tailored content was workshopped with an exercise physiologist for safety and soundness of health promotion advice, and with a behavioural scientist for content persuasion and computer-tailored technology support.

Additionally, the website was beta tested with two independent individuals for content readability and usability. However, the design of PCHF may have benefited from integrating research from computer-human interactive fields (80). For example, the program and website testing could have benefitted from iterative usability, or formative testing during the development. This has an advance over traditional health program (80), as iterative testing catches issues earlier on in the design process. This then increases the usability and decreases content relevance issues. Additionally, future studies like PCHF could utilise a co-design approach (59). Co-design is a process in which key stakeholders are not only consulted during a health intervention but are also fully ingratiated into every facet of the design process. This can create an intervention that has been refined through constant feedback over time, creating a more relevant and useful intervention (59). Either one of these approaches integrated into future computer-tailored programs may assist program efficacy.

The strengths of this thesis included the qualitative studies (see Chapters 3 and 4) which were able to reach data saturation. Furthermore, the design of the PCHF randomised controlled trial was strong. Participants were blinded to the true outcome of the study and were blindly randomised via an embedded computer algorithm. The intervention was mapped to previous efficacious theories and used multiple expert input to create a sound intervention. However, the PCHF study did not reach the required sample size, and resulted in a loss of statically power, especially for secondary outcomes. Furthermore, participant bias was high, with highly educated and highly active participants who engaged in the trial. This impacts the generalisability of the findings to the broader Australian and global prostate cancer survivor population. Nevertheless, this thesis was strengthened by broad geographical representation across Australia within PCHF, and also included participant recruited via health practitioners. This reflects possible referral pathways in the future, such as through community uptake or via clinical support.

Another limitation that should be mentioned is that the PCHF program was not specifically designed to be mobile friendly. The lack of capacity for multiple platform use of PCHF had knock on effects. Two participants wrongly enrolled into the study (and were withdrawn) as they were using their smart phones and clicked the wrong button. In terms of mobile phone use, one participant even mentioned that the ‘best bits’ of the PCHF should be integrated into an app. This advice should be noted, and programs like PCHF could learn from mobile phone industry leads and successful app developers that could aid the success of future programs (81). Academic digital health interventions often fall short in terms of quality and usability, whereas industry often tailored to pay attention to efficacy and clinical safety (81). There is therefore the potential to promote collaborations between academia and industry to create both industry suitable interventions with the emphasis on efficacy, quality, safety, and would increase the accessibility of quality products to the prostate cancer survivors (81).

### *Clinical Applications*

The findings of this thesis are timely, particularly within an Australian context. Two recent publications include the importance of exercise support for patients from both an Australian oncology (79), and exercise therapy (82) position. Both position statements indicate that exercise support within cancer care in Australia is critical in supporting quality of life for patients (79, 82). Unfortunately, it is not clear as to how to implement these guidelines or position statements. Possible care pathways are beginning to be discussed internationally (i.e. referral systems), but there are a number of challenges when connecting a patient to the required program (83). Issues can include inadequately funded exercise or physical activity programs, poor program advertising or modest program community support and uptake (84, 85). Furthermore, clinicians have short consultations with patients, and are required to cover a variety of oncology related issues (84-86). Therefore, clinicians may not have time to link patients to physical activity or supportive care programs (84-86).

As noted in the Clinical Oncology Society of Australia (COSA) guidelines, one potential solution might be that health professionals who are connected to cancer care should be required to promote physical activity and lifestyle support (79). This could involve general practitioners (GPs), who are often the primary doctor for cancer survivors' long-term follow up (87). GPs could utilise an established Australian allied health referral pathway known as a chronic disease management care plan (88). This scheme provides individuals for a referral for up to five allied health sessions. The allied health consultations are then either paid in full, or at a heavy discount by the Australian universal health care system (88). This established Australian referral pathway could generate the beginnings of an exercise partnership between prostate cancer survivors and exercise specialists. For those prostate cancer survivors who prefer to 'do their own thing', the exercise specialist could provide information on self-driven exercise programs, like that of PCHF or prescribing efficacious mobile apps (89). Online physical activity behavioural change interventions could therefore work alongside the standard pathways of care (83). Clinicians should also be aware that a variety of distanced based and supervised behaviour change programs could be effective (1), however, most programs are unlikely to bring about long-term habitual change (90). Therefore, health staff and multidisciplinary teams may need to prompt prostate cancer survivors if their overall activity levels are dropping in order help them to re-engage in exercise.

PCHF also has a few implications for clinical practice. The website architecture of an online health program is likely to impact how a participant uses the program. If the program offers free choice, the participants' might be more likely to access the modules that do not require coming back to the website. At this stage, it is not known how much the website architecture impacts actual behaviour change, as PCHF was not powered to detect physical activity behavioural differences. However, providing free tailored content online gives participants the opportunity to be in charge of how and when they interact with the information. It is therefore recommended that clinicians monitor the electronic and mobile health supportive care space. Specifically, GPs who support routine care and may be able to assist the uptake of prostate cancer survivors who are not meeting the exercise guidelines to efficacious and safe online programs. It is likely that online interventions for prostate cancer will increase in demand due to patient

interest (91), academic interest (37, 92) and uptake of technology in the elderly (15, 93, 94). To therefore meet an ever-increasing number of prostate cancer survivors (95, 96), online programs may well be utilised to meet this need for flexible, accessible and appropriate support.

## Thesis Conclusion

This thesis contains multiple manuscripts pertaining to the systematic development and trial of an online tailored physical activity intervention delivered in two methods. The systematic review (Chapter 2) noted that 8 of the 12 behavioural studies were efficacious, however factors that predict efficacy could not be calculated due to the heterogeneous nature of the studies. The qualitative investigations (Chapters 3 and 4) indicated that participants valued their health and desired a short and simple program that takes into account baseline fitness, preferences for social support and goal setting approaches, as well as the severity of their comorbidities. PCHF indicated that website architecture does indeed change the online behaviour of the individuals who used the program. Those in the free choice group accessed content that did not require ongoing visits to the website (the ‘once off modules’) and were less likely to use the physical activity monitoring logs compared to the standard tunnelled group. The self-selected nature of the PCHF recruitment indicated that participants who sign up via social media or support group were active at baseline and highly education, resulting in non-generalisable data. Recruitment methods may require more time and resources to ensure that a variety of participants engage with online programs, such as the use of cancer registries or clinical referral pathways. The outcomes of PCHF indicated that there is interest from prostate cancer survivors and health groups alike for online physical activity support. Importantly for future cancer and online program designers, changing the online website architecture is likely to influence how participants engage with the tailored modules. Overall, this thesis was able to contribute meaningful findings into an expanding area of online programming and prostate cancer survivorship care.

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## ***Appendix A: Free Choice Tailored Concept Book***

### *Getting Started Module*

#### INTRO\_MODULE1

#1

Welcome {user\_firstname} to Prostate Cancer Health and Fitness Online

Designed for prostate cancer survivors- PCHF aims to give you more tools in your mental toolkit to improve your health and fitness.

We'd like to ask you some questions before we show you the main content.

Why?

- Everyone is different and the advice we offer to you may not be suitable to someone else. The questions you answer will help us provide information relevant to you.

#### AGE

#2

What is your age?

#### FC\_PA\_Feel

#3

Pick an answer that best summarises how you feel about exercise

- ☐ I enjoy exercise
- ☐ I don't enjoy exercise but I should do it

#### Health\_functional

#4

**Jumps** to end

Do you have any health conditions have a functional impact on your capacity to be active? Soreness? Pain? Limited walking? Out of breath?



### *Getting Started Algorithms*

```
$fbbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show('TPROGRAM_INTRO', $fbbackGroups);  
show('TPA_OUTCOME_EXPECTATIONS', $fbbackGroups);  
if ($FC_PA_Feel == 1) show('TPA_FEEL_OK', $fbbackGroups);  
if ($FC_PA_Feel == 2) show('TPA_FEEL_GUILTY', $fbbackGroups);  
if ($AGE <= 65) show('TINTRO_AGE_UNDER65', $fbbackGroups);  
if ($AGE >= 65) show('TINTRO_AGE_OVER65', $fbbackGroups);  
if ($Health_functional == 1) show ('TFUNCTION_IMPACT_N', $fbbackGroups);  
if ($Health_functional == 2) show ('TFUNCTION_IMPACT_S', $fbbackGroups);  
if ($Health_functional == 3) show ('TFUNCTION_IMPACT_Y', $fbbackGroups);  
show('TREARCH_LINKS', $fbbackGroups);
```

## *Getting Started: Feedback*

TPROGRAM\_INTRO [Edit](#) [View](#)

Edited on 21/6/18 created on 18/6/18

Welcome to PCHF Online

The other modules listed below can be opened whenever you like in any order you would like to complete them

- Lone ranger or socialite? Exercising with others
- Making goals and overcoming barriers
- Making long term changes

### **The Physical Activity Log**

The physical activity tracking modules can only be completed on the **same day 7 days apart**

For example, I did the first physical activity tracking log on a Monday, so next Monday (in 7 days time) I will need to finish the next physical activity log

Ok {user\_firstname},

let's have a look at some tailored advice to you

Exercise guidelines for prostate cancer survivors

Working towards **150min of moderate to vigorous activity and 2 strength sessions a week**

- The guidelines state that those with cancer should consult with an exercise physiologist or physiotherapist
- Think about exercising at the same time, the same place, and same days to start to build in habits
- Learn more about the 2018 updated guidelines for Australian's with a history of cancer by clicking on the link

([https://www.mja.com.au/system/files/issues/209\\_06/10.5694mja18.00199.pdf](https://www.mja.com.au/system/files/issues/209_06/10.5694mja18.00199.pdf) )

Why strength training?

Often prostate cancer survivors who have had hormone treatment get told about muscle wastage and are given the advice to do strength training BUT... strength training is important for **all prostate cancer survivors**

### **WHY?**

Keeping your muscles strong is important as you age.

Stronger muscles mean you can lift, pull, push or get out of bed with ease for as long as you possibly can

Click '**next**' to find out more health messages specific to you

### **TPA\_OUTCOME\_EXPECTATIONS**

**What are the benefits of exercise?**

It can....

- strengthen muscles and bones and improve circulation,
- help you maintain or achieve a healthy weight,
- improve your energy levels,
- improve your mobility and balance,
- improve appearance and self-esteem,
- help you cope with stress, anxiety and depression.

It can also reduce the risk of (or help to manage):

- high blood pressure,
- heart disease,
- stroke,
- diabetes,
- osteoporosis
- and some cancers.

Is there anything else we have missed that you can think of? Can you think of benefits that are specific to your life?

TINTRO\_CONCLUSION [Edit](#) [View](#)

Edited on 24/7/18 created on 10/5/18

Thank you, that is the end of the module

You're welcome to use the site as much as you like

You can complete the other modules any time you like

Check out the library for exercise examples and extra information

Feel free to use the physical activity tracking modules can only be completed on the same day 7 days apart

TFUNCTION\_IMPACT\_Y [Edit](#) [View](#)

Edited on 21/6/18 created on 10/5/18

You said that other aspects of your health impact your ability to be active.

It's important that you work within your limitations and go at your own pace

If things get a bit tricky (in too much pain, want advice about adapted exercises to take into account your health conditions) you could

Chat to our expert by sending Holly an email.

Chat to your GP about your limitations and exercise and ask for advice

Find an exercise professional near you

Finding an exercise physiologist <https://www.essa.org.au/find-aep/>

Finding a

physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

TFUNCTION\_IMPACT\_N

Edited on 19/7/18 created on 10/5/18

Do what works for you

You said that other aspects of your health don't tend to impact your ability to be active. This is great

It's important that you work within your limitations and go at your own pace and it looks like that's what you're doing.

If things change you could:

Chat to our expert by sending Holly an email or look at the "Ask and Expert" section of the website

Chat to your GP about your limitations and exercise and ask for advice

Find an exercise professional near you

Finding an exercise physiologist <https://www.essa.org.au/find-aep/>

Finding a

physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

#### TFUNCTION\_IMPACT\_S

You said that other aspects of your health sometimes impact your ability to be active.

It's important that you work within your limitations and go at your own pace

If things get a bit tricky (in too much pain, want advice about adapted exercises to take into account your health conditions) you could

- Chat to our expert by sending Holly an email.
- Chat to your GP about your limitations and exercise and ask for advice
- Find an exercise professional near you
- Finding an exercise physiologist <https://www.essa.org.au/find-aep/>
- Finding a  
physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

#### TREARCH\_LINKS

Edited on 10/5/18 created on 10/5/18

#### TINTRO\_AGE\_OVER65

Make the most of the body you have

**FITNESS**

**STRENGTH**

**FLEXIBILITY**

As we age, our bodies do tend to not be what they used to be at 25- but that's no reason to make the most of what you have

Men over the age of 65 should be **active every day in as many ways as possible**, doing a range of physical activities that involve different parts of your body  
Start with small changes; if you try to go too hard too fast, it may cause a bit of muscle soreness to your body.  
See our frequently asked question section in our “Ask an Expert” to learn more about muscle soreness

Take into account your aches and pains: if they get worse, see a professional about how to become more physically active while looking after your body  
Variety is the spice of life: It is also important to incorporate fitness, strength, balance and flexibility into your life too, keeps exercise interesting as well as meeting different needs of your body

Aim to start to work towards the cancer guidelines of 150min of moderate to vigorous activity and 2 strength sessions a week  
Think about exercising at the same time, the same place, and same days to start building in habits

TINTRO\_AGE\_UNDER65 [Edit](#) [View](#)

Edited on 28/5/18 created on 28/5/18

### **Make the most of the body you have**

FITNESS

STRENGTH

FLEXIBILITY

As we age, our bodies do tend to not be what they used to be at 25- but that's no reason to make the most of what you have

Men under 65 should be **active every day in as many ways as possible**, doing a range of physical activities that involve different parts of your body

Start with small changes; if you try to go too hard too fast, it may cause a bit of muscle soreness to your body.

See our frequently asked question section in our “Ask an Expert” to learn more about muscle soreness

Take into account your aches and pains: if they get worse, see a professional about how to become more physically active while looking after your body

Variety is the spice of life: It is also important to incorporate fitness, strength, balance and flexibility into your life too, keeps exercise interesting as well as meeting different needs of your body

Aim to start to work towards the cancer guidelines of 150min of moderate to vigorous activity and 2 strength sessions a week

Think about exercising at the same time, the same place, and same days to start building in habits

TPA\_FEEL\_OK [Edit](#) [View](#)

Edited on 21/6/18 created on 19/6/18

Enjoy exercise? Then let's move!

It is great that you have already found exercise that you like doing.

Keep doing exercises that you enjoy over the next month. It is much easier to stick to an enjoyable routine.

If we recommend exercises that you don't enjoy so much, you might need to remind yourself of why you are trying them (e.g., to build strength you wouldn't otherwise build).

You probably already have good strategies to up your enjoyment (e.g. listen to music, find a podcast or audiobook do it with a friend). Keep this up, it will help with motivation.

TPA\_FEEL\_GUILTY [Edit](#) [View](#)

Edited on 21/6/18 created on 19/6/18

Feeling guilty about not moving as much as you think you ought to?

While guilt and shame can be useful at motivating us, the evidence points out that guilt and shame don't usually work in the long term for changing health behaviours.

If guilt is a key motivator for you, consider why this is the case.

Enjoyment is a better motivator for exercise than guilt in the long run. It is much easier to stick to an enjoyable routine than one we do because we think we should. With that in mind, we suggest you let go of guilt.

Think about it like this: The best time to plant a tree was 20 years ago, the best we can do now is to start today.

In the same way, don't dwell on the past, and try not to beat yourself up - let's think about what you need to do from now on.

**Focus on enjoyment. A big part of this is taking changing your exercise behaviour at your own pace.**

We will provide you with information about what is needed to squeeze the most benefits out of exercise, and you can decide how and when you do this.

If we recommend exercises that you don't enjoy so much, reminding yourself of why you are trying them (e.g., to build strength you wouldn't otherwise build) is ok, but we also suggest trying strategies to up your enjoyment too (e.g. listen to music, find a pod cast or audio book, do it with a friend etc.)

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information



## *Goals and Barriers Module*

### BARRIER

#1

This module is going to inform you about goal setting and barriers.

But lets find out a bit about you first

Most people have at least one thing that makes the likelihood of exercising go down.

Out of the options below, what would you say your **main** barrier is?

- ☐ Out of breath
- ☐ Incontinence
- ☐ Finding time
- ☐ Pain (arthritis, joint, muscle pain)
- ☐ Tired
- ☐ Low motivation
- ☐ Bad weather
- ☐ Finding activity boring
- ☐ Cost
- ☐ No one to exercise with
- ☐ My main barrier is not covered

### Barrier other

What is your main barrier? Can you tell us what strategies you currently use to address it? We will use the information to help us refine the website in the future.

## *Goals and Barrier Algorithms*

```
$fbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show('TGOALS_INTRO', $fbackGroups);  
show('TGOAL_SETTINGTIPS', $fbackGroups);  
show('TBARRIERS_INTRO', $fbackGroups);  
if ($BARRIER == 1) show('TBARRIER_BREATH', $fbackGroups);  
if ($BARRIER == 2) show('TBARRIER_INCONTINENCE', $fbackGroups);  
if ($BARRIER == 3) show('TBARRIER_TIME', $fbackGroups);  
if ($BARRIER == 4) show('TBARRIER_PAIN', $fbackGroups);  
if ($BARRIER == 5) show('TBARRIER_TIRED', $fbackGroups);  
if ($BARRIER == 6) show('TBARRER_MOTIVATION', $fbackGroups);  
if ($BARRIER == 7) show('TBARRIER_WEATHER', $fbackGroups);  
if ($BARRIER == 8) show('TBARRIER_BORING', $fbackGroups);  
if ($BARRIER == 9) show('TBARRIER_COST', $fbackGroups);  
if ($BARRIER == 10) show('TBARRIER_ISOLATED', $fbackGroups);  
if ($BARRIER == 11) show('TBARRIER_OTHER', $fbackGroups);  
show('TREARCH_LINKS', $fbackGroups);
```

## *Goals and Barriers Feedback*

TBARRIERS\_INTRO [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

### **Thinking of reasons that stop you from increasing your physical activity levels?**

#### **You're not alone with that!**

Most prostate cancer survivors find things like making the time to exercise, joint and muscle pain, incontinence, being tired, being in a bad mood, having low motivation or having a bad heart or lungs impacts their activity levels.

Let's have a look at some advice for what you said was the biggest barrier in general for you to move more...

TGOAL\_SETTINGTIPS [Edit](#) [View](#)

Edited on 21/6/18 created on 21/6/18

#### **TIPS FOR GOAL SETTING**

**Basic goal setting:** Think about what you want and small changes that might lead to it. Big goals, and little goals.

For example:

Big goal

I want to walk to my shop which is a 15min walk away to help my wife.

The little goal this week:

Walk to the letterbox 3 times this week to build up my walking stamina

#### **Advanced goal setting:**

#### **THINK "SMART": SPECIFIC, MEASURABLE, ATTAINABLE, RELEVANT AND TIME-BOUND**

Be SPECIFIC about what you want to achieve

Find a way to MEASURE the progress

Make sure your goal is ATTAINABLE

Think about the RELEVANCE of your goal to your life

Make sure your goal is TIME-BOUND

Find out more by visiting ["How to write a smart goal"](#)

Print out our [SMART Goals template](#) to fill out

T\_GOALS [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

Why are goals important?

**Research has shown consistently shown that people are better at making changes if they have goals to aim for.**

While this program is asking you about minutes of activity, or strength training sessions- think about what you ACTUALLY want: Practical goals

Practical goals could include;

- to lose weight,
- to find activity or exercise that I enjoy
- to stay in my own home longer,
- to stop falling over and avoid going to the hospital,
- to help my wife with the shopping,
- to pick up my grandkids,
- to go travelling
- or to prune that fruit tree I've been meaning to get to...

- Whatever your goal is, **write it and keep it somewhere where you can look at it regularly-**
- This will help remind you what you're aiming for when things get a bit hard
- **Turning goals into habits:** Aim to make a goal to exercise at the **same time and same place**
- For example "No matter what I aim to walk for 15 mins on Mondays, Wednesdays and Fridays from 8 to 8.15am"

Wanna find out more? Read the articles about behaviour change in our library?

TBARRIER\_OTHER [Edit](#) [View](#)

Edited on 27/6/18created on 27/6/18

Facing barriers to being more active

In the list we provided, you said that the main barrier you face was not listed and we asked you to provide feedback on what we missed.

However, we do know that identifying the barriers you face and brainstorming ways to overcome them can really help.

Whatever it is, have a think about why you consider it your main barrier and think about possible solutions that best suit you in your life

If you have trouble thinking of ways to overcome the barrier that is stopping you -> contact our expert clinical exercise physiologist Holly in the "Ask an Expert" section of PCHF

TBARRIER\_BREATH [Edit](#) [View](#)

Edited on 27/6/18created on 27/6/18

Out of breath

You said that a barrier to exercise is getting out of breath quickly. We know it can be pretty frustrating when you're trying to move.

Here are some tips with this in mind:

Gentle walking, do what you can until you feel that you need to stop, rest, and then give it another burst

If you have asthma, take your preventer (usually the blue one) 30 min before exercise and bring it with you

You don't have to do the vigorous activity which makes you huff and puff very quickly, anything helps

Start slow, if you keep at it, you will be surprised how quickly your body, heart and lungs will get used to it (and it will feel better)

Yoga, and Ti- chi, and swimming are exercises that have breathing techniques and big fluid movements which assist with breathing

### **Where can you get further help?**

Ask Holly (accredited exercise physiologist) using the “Ask an Expert” section of the website

Or- you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.

You can find a list of all accredited exercise physiologists working within Australia [here](#) and a list of physiotherapists [here](#)

- <https://www.betterhealth.vic.gov.au/health/HealthyLiving/breathing-problems-and-exercise>
- <http://exerciseismedicine.com.au/wp-content/uploads/2016/11/2014-Chronic-Heart-Failure-FULL.pdf>
- <https://www.asthmaaustralia.org.au/wa/about-asthma/manage-your-asthma/triggers/exercise/exercise-and-asthma>
- <http://www.health.com/asthma/14-best-and-worst-exercises-for-asthma#walking>

### **TBARRIER\_INCONTINENCE**

Edited on 30/7/18 created on 27/6/18

Leaking...

Exercising with incontinence is tricky- here are some tips that might help

Try fluid movement exercises, such as swimming, yoga or tai-chi: These exercises have reduced bouncing movement and may reduce your risk of leaking.

- Wear a pad if you're going for a walk or doing non-water based-activity: the reality is you might leak and that's ok. It's part of prostate cancer survivorship and the good thing is no one has to know you're wearing one.

- Plan your escape path - Learn where your public toilets are and map out a walk around these
- Exercise from home using home bases resistance or aerobic activities. Strength-training, in particular, can be easy to complete at home. There are example exercises in our library.
- You've probably heard it, but you've got to keep going on those pelvic floor muscle activities

### **Where can you get further help?**

- You can ask Holly, our accredited exercise physiologist using the "Ask an Expert" section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.
- Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.
- Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)
- There is an information booklet in our library that describes pelvic floor exercises and self-check tests that you can do.
- If you have severe leaking please talk to your GP.

### **Pelvic Floor Exercises: Retraining your bladder from the Continence Foundation**

You've probably heard it, but you've got to keep going on those pelvic floor muscle activities

Learn how:

Sit or lie down with the muscles of your thighs, buttocks and stomach relaxed. It may be useful to use a hand mirror to watch your pelvic floor muscles as they pull up.

Gently squeeze the ring of muscle around the back passage as if you are trying to stop passing wind. Now relax this muscle. Squeeze and let go a couple of times until you are sure you have found the right muscles. Try not to squeeze your buttocks.

When going to the toilet to empty your bladder, try to stop the stream of urine, then start it again. Do this to learn which muscles are the right ones to use – but only once a week.

Your bladder may not empty the way it should if you stop and start your stream more often than that.

#### MORE INFORMATION

- <https://www.continence.org.au/pages/pelvic-floor-muscle-exercises.html>
- <https://www.continence.org.au/pages/pelvic-floor-men.html>

Prostate cancer Foundation: 1-hour lecture on Men's Continence and Erectile Issues

- [https://www.youtube.com/watch?v=ZICTRhQQ\\_g8](https://www.youtube.com/watch?v=ZICTRhQQ_g8)

TBARRIER\_TIME [Edit](#) [View](#)

Edited on 31/7/18 created on 27/6/18

#### Finding time

Finding the time to exercise is tricky. Everyone is busy in different ways and finding ways to get activity automatically into your day, little bits at a time might help

Here are some things that may help you to fit more physical activity into your day:

- Don't worry about finding the closest possible parking space to where you are going. Park a tad further away and walk the rest.
- In the same vein, if you're in the city walk an extra bus or train stop if it is feasible,
- Take the stairs instead of the lift wherever you can.
- Watching TV? Do strength training while you watch. There are some example exercises in our library.



- Catching up with a friend? Walk and talk or work on something physical together.
- At work? Find ways to get up from your desk to get water, a cup of tea, fresh air, a lunchtime walk
- Exercise while dinner is cooking

By combining exercise with something you were doing anyway, these strategies can help you become more active without taking much time at all.

This can be a good start. Though, if you want to really up your exercise and focus on improving strength and fitness you might need to find time to fit in some structured exercise sessions. The best way of doing this is, and making sure you actually do it, is to plan your week in advance and schedule exercise in just as you would any other appointment.

There are significant benefits to be had from a 10-minute structured exercise session. If you are not exercising as much as you would like to be, consider when you can fit in 10, 20 or 30 minutes of exercise over the next week and **make an appointment with yourself to do it.**

Have a think about your day- can you prioritise making time to be more active?

TBARRIER\_PAIN [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

Exercising with pain

Exercising with joint, muscle or arthritic pain is frustrating, and we understand its challenging to move more. However, if you don't move at all, your movement will

continue to drop over time and it will get harder to use your body.

### **Here are some tips for exercising with pain**

Exercising with joint, muscle or arthritic pain is frustrating, and we understand it's challenging to move more.

**However, if you don't move at all, your movement will continue to drop over time and it will get harder to use your body.**

- Book in with an exercise physiologist or physio: These people are experts and will help assist movement with pain.
- You can book one your self, or ask your GP for advice and a Chronic Disease Management Plan to get support
- Do what you can, and build up over time. Every little bit counts
- Move for short periods of time, but make it often
- Always warm up and stretch
- Try being in water: hydrotherapy takes the weight out of the equation and can relieve pain.
- Overweight?
- If your joints aren't having to carry as much weight, you can significantly reduce your pain levels. Consider strategies for your diet as well if other aspects aren't working.

### **Where can you get further help?**

- You can ask Holly, our accredited exercise physiologist using the "Ask an Expert" section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.

Or- you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.

Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)

Check out these fact sheets

- [Exercising and arthritis](#)
- [Exercising with lower back pain](#)
- [Exercising with cancer](#)
- [Exercising with prostate cancer](#)
- [When in pain- should I rest or exercise?](#)

TBARRIER\_WEATHER [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

Whatever the weather

When the weather isn't nice, its pretty understandable about not wanting exercise. Here are some tips for maintaining activity levels when the weather isn't cutting it.

### **Get the right equipment:**

Wet weather: Can you purchase a rain jacket? Can your shoes cope in the wet?

Cold weather: Can you wear the right clothes to walk in the cold?

Warm weather: Walking in the shade? Breathable clothing? Lots of water?

**Changing your thoughts:** The way we think about the weather can change our behaviour

Think about if you can cope if you get cold/ wet or hot and sweaty? Can you come home after 20min, have a shower and get changed?

Can you exercise if it is unpleasant: knowing you can come home in just a bit?

### **Exercise from home is a great way to move more when the weather is terrible**

- Waiting for the kettle to boil? Try pacing around the kitchen, doing some arm or calf raises while you wait

- Watching TV? Walk around the house during the ad break or do strength training while you watch
- Do some strength exercises at home: **check out the videos in the library for ideas**
- Do the dishes, or clean out a cupboard
- Cleaning burns calories too!
- Did you dance when you were younger?
- Put your favourite music on that makes you want to move,
- No one can see you so just do what you want to

### Where can you get further help?

- You can ask Holly, our accredited exercise physiologist using the “Ask an Expert” section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.

Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.

Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)

TBARRIER\_TIRED [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

When you're tired...

Exercising when you're tired and lethargic is hard, this is a common feeling felt by many prostate cancer survivors. Ironically, the more you move the more energy you will have.

Cancer-related fatigue (CRF): CRF is pretty common, especially in those who are closer to their treatment.

Check out the fact sheet [here](#) about cancer-related fatigue

### Exercising tips for tired men...

- As tempting as it is to have a nap on the couch- you have to move
- Do the "5" min test. Try walking or doing something active for just 5 minutes: you might find that starting was the hard part, but you also have permission to stop after 5 min if its just not happening
- If timing exercise isn't your thing, adjust how exhausted you feel instead using the exhaustion measure (it's in the library)
- Go for a gentle walk: it doesn't have to be vigorous activity
- Try gentle swimming
- Build exercise into your routine, when it's in there it will make it easier to do even if you're tired
- Build in rewards, if you go for a walk to the coffee shop, you can meet up with your mate
- Get more sleep
  - Have a think about your sleeping patterns at the moment.
  - Do you snore most nights? Sometimes snoring can be linked to more serious sleeping issues
  - If sleep is a problem, take a look at your sleeping patterns and talk to your doctor

TBARRIER\_BORING [Edit](#) [View](#)

Edited on 27/6/18created on 27/6/18

Make exercise more enjoyable

Find exercise boring? You're not alone! Lots of people don't exercise as the idea of walking on a treadmill with daytime television the most boring thing in the world

Tips for making things a little less boring

- Think about what you did as a kid- what did you find fun? Was it games, and being with friends? Was it getting outdoors? Draw on this if you can.
- Set yourself challenges, track your progress and pick a 'trophy'. Better health might be reward enough but some people find having something else to work towards extra motivating (e.g., a holiday)

- Listen to music or radio programs that you like while you exercise
- Reflect on why you find exercise boring. At a nuts and bolts level, exercise is really just moving your body. If you understand what you find boring, with some creativity you might be able to come up with an exercise routine that you like.

TBARRIER\_COST [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

When money is tight

- We understand that most people are on a tight budget, but the good thing is that exercising does not have to be expensive
- Once you've got some walking shoes, walking is free and one of the best types of exercises you can do.
- Look at the library page of this website for the fact sheets which show **exercises around the home for free.**
- Walking is one of the best ways to stay active and it's free (well, once you have shoes)!
- Gym memberships are expensive – what can people do if this is where they want to exercise?
- Try shopping around, you might be surprised is around- perhaps it might just be one class a week for usually less than \$10
- Try a home-based or community program: see if your local council or community groups may offer free or cheap classes, or even a community garden
- Equipment doesn't have to be expensive
- **Borrow** what you can
- You can replace weights with water bottles or cans of vegetables
- Note that free stuff doesn't have to be less fun/ or less effective.
- Find exercise equipment in your local parks
- Often parks have free easy to use equipment that you might be able to give a go

Exercise from home

- Watching TV? Walk around the house during the ad break or do strength training while you watch
- Do some strength exercises at home: check out the video library
- Cleaning burns calories too!
- Do the dishes, or clean out a cupboard or vacuum/mop the floor: every bit helps
- Did you dance when you were younger?
- Put your favourite music on that makes you want to move,
- No one can see you so just do what you want to

TBARRIER\_ISOLATED [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

No one to exercise with?

Having no one to exercise with can be challenging, especially when doing activity on your own is hard enough.

Here are some tips we thought of, but you might think of your own

- Odds are there are others in the same position as you
- The Men's Shed movement is one which links men together where you can work on projects. [Find one near you](#)
- If you're not part of a community group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say
- [Find a group](#)
- [What are the prostate cancer foundation support groups?](#)
- Call up your council: often there are free or discounted community exercise
- Did you know that there are free walking groups with the Heart Foundation?
- Find a FREE group
- [Heart Foundation Site](#)

Like technology?

Have a look at this summary page of different virtual apps that could help <https://www.wikihow.com/Find-a-Virtual-Workout-Partner>

T\_RESEARCHLINKS

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

See you next week: good luck meeting your goal



## *Social Support Module*

### SOCIALSUPPORTPREF

#1

Lone ranger or socialite?

Which sentence do you think is the most relatable to you when it comes to exercise?

- ☐ I like to exercise alone. I'm pretty good at sticking to things when I set them.
- ☐ I like to exercise mostly alone, but sometimes it helps with someone else asks if they come with me can be good
- ☐ I tend to like to do things by myself but to be honest, I'm not great at sticking with it
- ☐ I like a mix, sometimes alone and sometimes with others. Depends on how I'm feeling or the activity I'm doing
- ☐ I like being with a friend, partner or group when I do activity

### Socialsupport\_satis

Are you happy with your current level of support you get from your partner/  
community/ friends/ family or professionals?

- ☐ Not really
- ☐ Yeah its ok

### *Social Support Algorithms*

```
fbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show ('TSOCIAL_INTRO', $fbackGroups);  
  
//not happy with support  
if ($SOCIALSUPPORTPREF == 1 && $Socialsupport_satis= 1 ) show  
('TSOCIAL_6', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 2 && $Socialsupport_satis= 1 ) show  
('TSOCIAL_7', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 3 && $Socialsupport_satis= 1 ) show  
('TSOCIAL_8', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 4 && $Socialsupport_satis= 1 ) show  
('TSOCIAL_9', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 5 && $Socialsupport_satis= 1 ) show  
('TSOCIAL_10', $fbackGroups);  
  
//happy with support  
if ($SOCIALSUPPORTPREF == 1 && $Socialsupport_satis= 2 ) show  
('TSOCIAL_1', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 2 && $Socialsupport_satis= 2 ) show  
('TSOCIAL_2', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 3 && $Socialsupport_satis= 2 ) show  
('TSOCIAL_3', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 4 && $Socialsupport_satis= 2 ) show  
('TSOCIAL_4', $fbackGroups);  
if ($SOCIALSUPPORTPREF == 5 && $Socialsupport_satis= 2 ) show  
('TSOCIAL_5', $fbackGroups);  
show('TREARCH_LINKS', $fbackGroups);
```

## *Social Support Feedback*

TSOCIAL\_1 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Doing stuff by yourself is great. It means you're self-motivated and that's brilliant.

Keep doing what you're doing as its working for you.

If things change down the track....

- If something changes, have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Have a think about what might work for you
- Additionally, what might be going on in your community? Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_2 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Its great that you are able to get on with things alone for the most part- it means your self-motivated and this is fantastic.

Keep doing what you're doing as its working for you.

If things change down the track....

- If something changes, have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Have a think about what might work for you

Other tips and tricks

- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

Edited on 6/7/18 created on 6/7/18

Being able to exercise alone and with others is a good balance, but we know its hard when there aren't other people to help to keep you accountable. However, if you're happy with how you're tracking, that's good. Keep doing what you're doing.

Here are some tips we thought of, but you might think of your own

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.
- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional

Did you know that those with good social networks tend to stick with their exercise goals longer?

- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_4 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Mixing alone activity with social activity is great! Keep it up

If you're happy with how you're tracking, that's good. Keep doing what you're doing.

Here are some general tips we thought of - but you might think of your own

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.
- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional

Did you know that those with good social networks tend to stick with their exercise goals longer?

- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

Edited on 6/7/18 created on 6/7/18

Exercising with others can often work well when you're getting more active

Exercising with others often means that you'll stick with the activities you've set out to do: at least according to theory. Overall, the research shows that those with good social networks tend to stick with their exercise goals longer?

If you're happy with how you're tracking, that's good. Keep doing what you're doing.

- If things change or you'd like to do more activity on your own (for example if someone cancels on you) we have thought of some ideas - but you'll think of your own and what suits you
- Have a brainstorm about things you might like to do on your own that you would be able to integrate into your life.
- If you like videos, have a look at our library for instructions on activities to do on your own.
- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.
- If you like to be around others, we had a few other ideas: Though you might already have known about these or already do things.
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- It might not work for some people, but sometimes it can be great to find something new.
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.

- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- If you're not part of a community group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say
- [Find a group](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_6 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Doing stuff by yourself is great. It means you're self-motivated and that's brilliant.

- However, you said that you're not really happy with the level of support that you're receiving.
- We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?
- What might you like to do in terms of building up your support network?
- It might be a partner, a friend, a family member, or a professional
- Here are some tips that might work for you, but you might come up with your own
- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.



- Did you know that those with good social networks tend to stick with their exercise goals longer?

It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment

Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?

- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location.
- Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_7 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Its great that you are able to get on with things alone for the most part- it means your self-motivated and this is fantastic.

However, you said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would it do to your ability to be more active?

Here are some tips that might work for you, but you might come up with your own

- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_8 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Being able to exercise alone and with others is a good balance, but we know its hard when there aren't other people to help to keep you accountable.

You said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you
- What you might like to do in terms of building up your support network?
- It might be a partner, a friend, a family member, or a professional

Here are some tips that might work for you, but you might come up with your own.

- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_9 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Mixing alone activity with social activity is great! Keep it up

You said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?

Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you

What might you like to do in terms of building up your support network?

It might be a partner, a friend, a family member, or a professional

Here are some tips that might work for you, but you might come up with your own.

- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?

- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
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- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_10 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Exercising with others can often work well when you're getting more active

However, you said that you're not really happy with the level of support that you're receiving.

The benefits of exercising with others

- Exercising with others often means that you'll stick with the activities you've set out to do: at least according to theory.
- Overall, the research shows that those with good social networks tend to stick with their exercise goals longer

One needs to be self-motivated too

- Have a brainstorm about things you might like to do on your own that you would be able to integrate into your life.
- If someone cancels on you and you're on your own, you'll need to think of ways to stay active.
- If you like videos, have a look at our library for instructions on activities to do on your own.

- If you like to be around others and want to increase your levels of community: we had a few other ideas: Though you might already have known about these or already do things.
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)
- If you're not part of a community group or the online group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say

#### T\_RESEARCHLINKS

#### WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and examples of exercises and more general information

## *Long Term Habits Module*

### Goal\_3

#1

Are you currently meeting your physical activity goals?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I don't have a physical activity goal

### Automatic\_Likert

#2

Select a response which best fits for you.

Deciding to engage in physical activity is something I do...

Strongly Disagree (1)

Strongly Agree (7)

Auto\_1: Automatically

Auto\_2: Without thinking

Auto\_3: Without having to consciously remember

Auto\_4: Without realising I'm doing it

### *Long Term Habits Module Algorithms*

```
$fbackGroups = ['FREE', 'FINISHEDCONTROL'];
show('TLT_INTRO', $fbackGroups);
$habitstrength = ($Auto_1 + $Auto_2 + $Auto_3 + $Auto_4);
//create a variable ranging from 0-24 (by ensuring response option ranges from 0-6
rather than 1-7)
if ($Goal_3 == 1 && $habitstrength <= 12) show ('TMessage_1', $fbackGroups);
if ($Goal_3 == 2 && $habitstrength <= 12) show ('TMessage_2', $fbackGroups);
if ($Goal_3 == 3 && $habitstrength <= 12) show ('TMessage_3', $fbackGroups);
if ($Goal_3 == 4 && $habitstrength <= 12) show ('TMessage_4', $fbackGroups);
if ($Goal_3 == 5 && $habitstrength <= 12) show ('TMessage_5', $fbackGroups);
//goal = 5 is no goal at all and low habit strength
if ($Goal_3 == 1 && $habitstrength > 12) show ('TMessage_6', $fbackGroups);
if ($Goal_3 == 2 && $habitstrength > 12) show ('TMessage_7', $fbackGroups);
if ($Goal_3 == 3 && $habitstrength > 12) show ('TMessage_8', $fbackGroups);
if ($Goal_3 == 4 && $habitstrength > 12) show ('TMessage_9', $fbackGroups);
if ($Goal_3 == 5 && $habitstrength > 12) show ('TMessage_10', $fbackGroups);
// goal = 5 is no goal at all and high habit strength
// message 5 and 10 no goal
show('TREARCH_LINKS', $fbackGroups);
```



## *Long Term Module Feedback*

TLT\_INTRO

Hi {user\_firstname}

### **This module is about making long term changes**

Long-term behaviour is often talked about in terms of habits. Habits are formed by repetition. In particular, when we repeat the same activity in response to the same prompt or cue over and over again.

It's not a quick fix- and while we like instant results, research shows that it can take 1-2 months to form new habits.

Think of physical activity becoming a normal part of your life, as opposed to the exception

- If you didn't quite meet your goals, or you get an injury, don't beat yourself up about it
- If you haven't already, ask someone to help to keep you accountable
- If you go backwards for a bit, that's fine, its all about steady engagement with physical activity
- Change is slow, so it's important to write down, or monitor in some form what you're doing- that way you can look back in a couple of weeks and see how you're doing.
- Sometimes you'll see obvious improvements, while others aren't so obvious. The main thing is to keep doing as much as you can

TAutonomy\_intro [Edit](#) [View](#)

Edited on 13/7/18 created on 13/7/18

### **Making long term changes**

Long-term behaviour is often talked about in terms of habits.

Habits are formed by repetition. In particular, when we repeat the same activity in response to the same prompt or cue over and over again.

It's not a quick fix- and while we like instant results, research shows that it can take 1-2 months to form new habits.

## Physical Activity Log Week 1

TMessage\_1 [Edit](#) [View](#)

Edited on 13/7/18 created on 13/7/18

Wow, you're on a roll!

- You said that you're not only happy with the goals you're setting but you also want to do more next week.
- You also said that sometimes activity is not really an automatic part of your day and you might have to make a bit of an effort to make things happen.
- While things might not be on 'auto' pilot for you- you're making a real effort to build up your activity.

It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you'll exercise.

Some people get sick of this after a while so it is good to 'protect yourself' by making activity a bit more automatic.

Here is how you can do that:

- The idea is that we go from having to make a lot of effort and getting into an 'auto pilot' mode- to the point where you don't even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.
- It's the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.

Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_2 [Edit](#) [View](#)

Edited on 13/7/18 created on 13/7/18

Great news- you're doing really well

- 
- You said you're happy with the goal that you have and you're going to stay the same for now.
- Keep maintaining what you are already doing, but one thing to consider are the principles of habit formation.
- Your scores suggested your physical activity behaviour is not very automatic at the moment- you have to make a real effort to plan to do it.
- Some people get sick of this after a while so it is good to 'protect yourself' by making activity a bit more automatic.

Here is how you can do that:

- The idea is that we go from having to make a lot of effort and getting into an 'auto pilot' mode- to the point where you don't even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.
- It's the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.
- Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_3 [Edit](#) [View](#)

Edited on 13/7/18 created on 13/7/18

Thinking about habits

- You said your goal was sort of tricky and you also scored fairly low-moderate on the automatic behaviour scale.
- This is ok, but one thing that might make meeting your goals easier is thinking about habit formation.
- It will take the same amount of effort that you are putting it now, but will result in you not having to stew over it later.
- It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you'll exercise.
- Some people get sick of this after a while so it is good to 'protect yourself' by making activity a bit more automatic.

Here is how you can do that:

The idea is that we go from having to make a lot of effort and getting into an 'auto pilot' mode- to the point where you don't even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.

It's the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.

Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_4 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

How to make your goals easier to meet

One thing that might make meeting your goals easier is thinking about habit formation. You scored in the low-moderate range of the automatic behaviour scale meaning that you have to make a real effort to get that activity booked in to meet your goals

If you can work towards getting activity as a habit, will take the same amount of effort that you are putting it now, but will result in you not having to stew over it later.

It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you'll exercise.

Some people get sick of this after a while so it is good to 'protect yourself' by making activity a bit more automatic

Here is how you can do that:

- The idea is that we go from having to make a lot of effort and getting into an 'auto pilot' mode- to the point where you don't even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.
- It's the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.

Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_5 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

Goals and habits?

If you are not that into setting goals, its fair enough as it's not for everyone.

If you're doing a lot of activity, it is likely that you've found what works for you which is great

If you're not doing a lot of activity for you (remember it's about being better than before) maybe think about *when* you exercise rather than how much you do...

### *Habits*

- Getting it into a daily or weekly habit means you won't have to put as much effort into being more active- you'll barely notice it the same way that you might brush your teeth each night and think nothing of it.
- This is based on what we know about habit formation.
- If you can start by exercising at the same time, and attach it to another event – you won't have to plan as much

Have a think about what might work for you, and we highly encourage you to actually put a goal in place if you're not happy with the amount that you're achieving.

TMessage\_6 [Edit](#) [View](#)

Edited on 13/7/18 created on 13/7/18

Wow! You're on a roll!

You said you're wanting to increase your behaviour and that you do tend to do things in an automatic way. Sweet.

Here is why that is great news.

- Those who are able to get things into 'automatic' gear mean that the changes you make now to increase your exercise and activity are more likely to stick. It means you might get to a point where you don't even realise you're being more active as it becomes a part of your life: the same way you might clean your teeth at night.
- This gives you a much higher chance of success at making this changes that you're committing too easier to maintain in the long run.

TMessage\_7 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

Keep up the good work!

You said you're happy with the goals your setting at you want to maintain this level.

You also scored moderate-high on the automatic behaviour score

Here is why that is great news.

- Those who are able to get things into 'automatic' gear mean that the changes you make now to increase your exercise and activity are more likely to stick. It means you might get to a point where you don't even realise you're being more active as it becomes a part of your life: the same way you might clean your teeth at night.
- This gives you a much higher chance of success at making this changes that you're committing too easier to maintain in the long run.

TMessage\_8 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

You're doing ok- keep going

You scored high on 'automaticity'. This is really good.

- It means that you're able to think about integrating physical activity automatically into your life.
- This makes it easier in general to be more activity over time.
- Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.
- You also said that were 'sort of' able to meet your activity goal. Have a think about what has made your goal harder to reach?



- Is your goal too high? Have you got enough support? Did you schedule your activity in? Have a think about what happened this week to mean that you feel you're not happy with the goal.

TMessage\_9 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

Hard week, but you're doing ok

- You said that your goal was hard to reach this week. What do you think has made your goal harder?
- But... You scored high on 'automaticity'. This is really good.
- It means that you're able to think about integrating physical activity automatically into your life.
- This makes it easier in general to be more activity over time.
- Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.
- Have a think- Is your goal too high? Have you got enough support? Did you schedule your activity in?

TMessage\_10 [Edit](#) [View](#)

Edited on 13/7/18created on 13/7/18

Going on autopilot

- You scored moderate- high on 'automaticity'. This is really good.
- It means that you're able to think about integrating physical activity automatically into your life.
- This makes it easier in general to be more activity over time.
- Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.

- How did you establish such a solid activity routine? Are you open to using the same approach to increase your activity?
- If you're able to continue these habits and we encourage you to work towards doing 150 minutes a week of aerobic activity and 2 sessions of strength training a week is considered the optimal amount for obtaining health benefits.
- If you're feeling that you're doing as much as you can without making goals, keep going and do what works for you

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

## *Physical Activity Log 1*

### FREECHOICE PA INTRO

#1

Let's look at your activity

- In here you can log in **every 7 days**
- Use the chart and to map your progress over time
- We will ask you if you're happy with the goals that you're setting yourself each week
- **Using the rest of the program**
- You can access the other modules of information at any time

FC\_Physical\_Activity\_\_1

### PA MVPA intro

#2

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

### AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

## RATING OF PERCEIVED EXERTION SCALE

A RPE scale is a subjective scale used to measure the intensity of your exercise.

Level	Perceived Exertion	Description	% of Max Heart Rate
0	No Exertion	"Sitting on the couch"	50-60%
1	Very Light	"Activity is comfortable and you could maintain this intensity for an extended period of time"	
2	Light	"Deeper but comfortable breathing – able to hold a conversation"	60-70%
3	Somewhat Hard	"Somewhat hard, but still feels OK to continue"	70-80%
4			
5	Hard	"You are breathing heavily - still somewhat comfortable, however exercise is becoming noticeably more difficult"	80-90%
6			
7	Very Hard	"You can continue, however you really have to push yourself. It feels very heavy and you are very tired"	90-100%
8	Extremely Hard	"Your breathing is laboured, your arms and legs are very heavy and you want to stop"	
9			
10	Maximal Exertion	"Strongest effort and exertion you have ever experienced"	

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### MOD MINS 1

#3

### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

#### VIG MINS 1

#4

#### Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skipping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

#### RES SESS 1

#5

#### RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training,	Repeated shoveling in the garden Specific exercises, for example

is a form of training in which you are working against some type of force that resists your body movements.	Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges
Resistance bands	Step-ups
Weights	Calf raises
Your own body	Core bracing
They are designed to build up muscle, strength, endurance and power.	Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES\_EXEC\_1

#6

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

RESS\_EXHAUST\_1

#7

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

DAYS ACTIVE 1

#8

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

Health functional

#9

Do you have any health conditions that have a functional impact on your capacity to be active?

Soreness? Pain? Limited walking? Out of breath?

☐ No

☐ Sometimes

☐ Yes

### *Physical Activity Log Week 1 Algorithms*

```
$fbackGroups = ['FREE', 'FINISHEDCONTROL'];
```

```
show('TINTRO_PA_LOG1', $fbackGroups);
```

```
if ($DAYS_ACTIVE == 0) show ('TDAYS_NONE', $fbackGroups);
```

```
if ($DAYS_ACTIVE >= 1 && $DAYS_ACTIVE < 2 ) show ('TDAYS_FEW',  
$fbackGroups);
```

```
if ($DAYS_ACTIVE >= 3 && $DAYS_ACTIVE < 5 ) show ('TDAYS_SOME',  
$fbackGroups);
```

```
if ($DAYS_ACTIVE >= 5) show ('TDAYS_LOTS', $fbackGroups);
```

```
if ($DAYS_ACTIVE > 0) show ('TMVPA_1_GRAPH', $fbackGroups);
```

```
if (TRESS_SESS_1 > 0) show ('TRESS_SESS_1', $fbackGroups);
```

```
if (TRESS_EX_1 > 0) show ('TRESS_EX_1', $fbackGroups);
```

```
if (TRESS_EXHAUST_1 > 0) show('TRESS_EXHAUST_1', $fbackGroups);
```

```
show('TREARCH_LINKS', $fbackGroups);
```

```
show('TWEEK1_GOALSET', $fbackGroups);
```

```
show ('Tconclusion', $fbackGroups);
```



## *Physical Activity Log Week 1 Feedback*

### PHYSICAL ACTIVITY LOG WEEK 1

This is the physical activity log that you can fill in every 7 days

The guidelines are 150mins of moderate-vigorous activity and 2 strength training sessions for cancer survivors ....BUT we know this isn't reachable for many prostate cancer survivors

If the guidelines aren't right for you at this point: set your own goals about becoming more active

Have a look at the goal setting and barrier module for more information

**Look at your week 1 levels, and think about any changes and goals for the next week, come back in 7 days and we'll ask you how you felt you went over the week.**

### TMVPA\_1\_GRAPH

Edited on 19/7/18 created on 7/5/18

Minutes of Moderate and Vigorous Activity

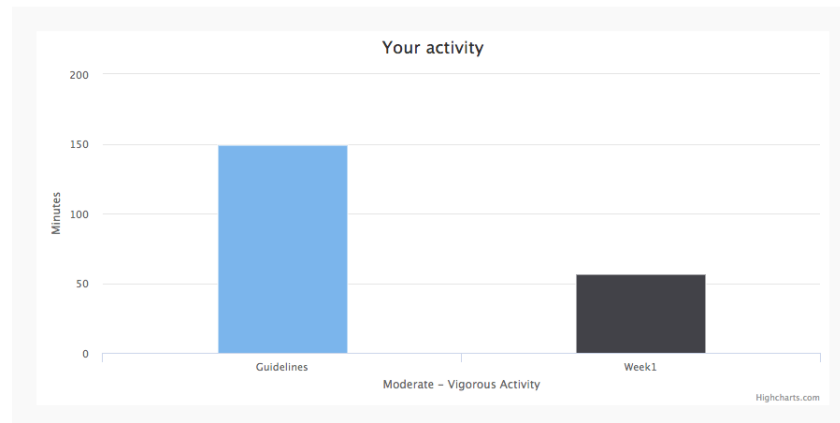
This is your baseline- something to work from

Moderate - Vigorous Activity Minutes Your

activity Week 10 20 40 60 80 100 Highcharts.com

## Minutes of Moderate and Vigorous Activity

- Cardio / aerobic activity



## TRESS\_SESS\_1

Edited on 21/6/18 created on 7/5/18

Lets have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

Strength Training Week 1 Ideal number of sessions

Your sessions week 1050100150200250300Highcharts.com

 TRESS\_SESS\_1  

Edited 33 minutes ago  
created 33 minutes ago

Lets have a look at your strength (resistance) training levels-

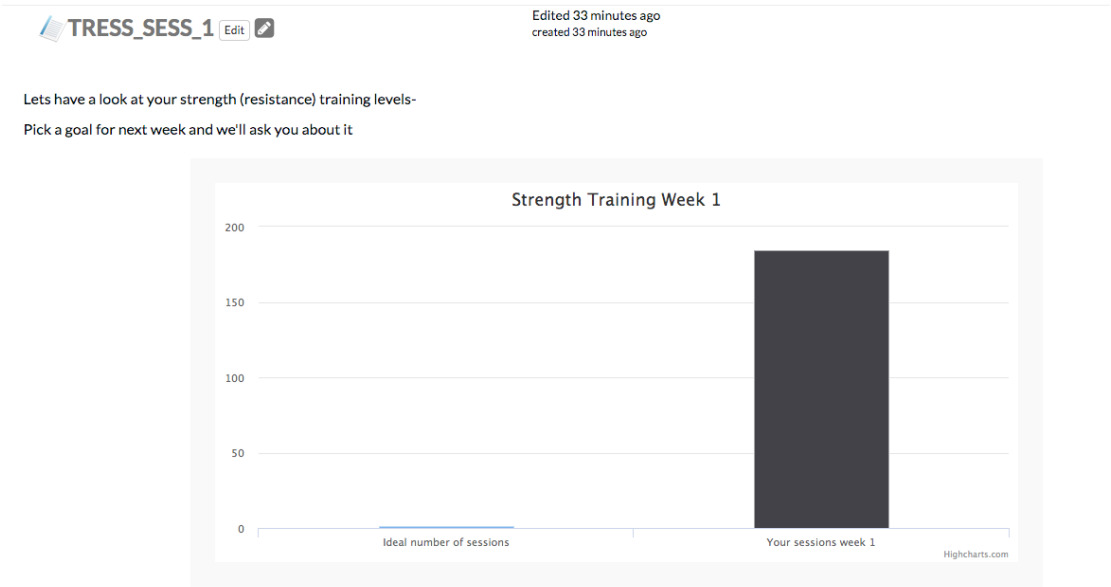
Pick a goal for next week and we'll ask you about it



TRESS\_EX\_1

Edited on 7/5/18created on 7/5/18

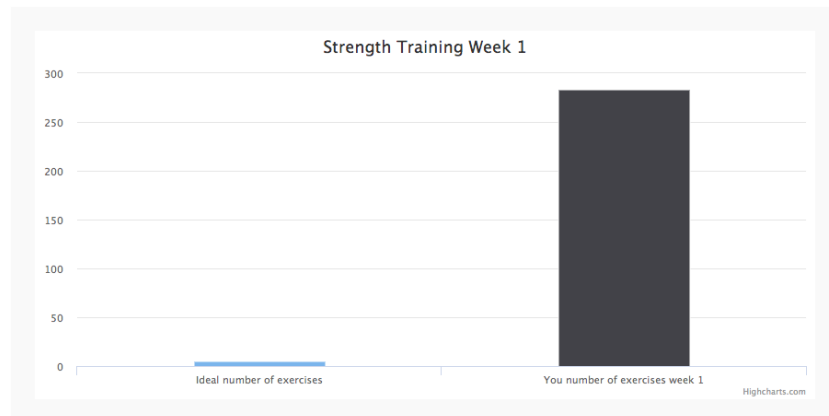
Strength Training Week 1Ideal number of exercisesYou number of exercises week  
1050100150200250300350Highcharts.com



TRESS\_EXHAUST\_2

Edited on 19/6/18created on 7/5/18

Strength Training Week 1Ideal level of exhaustion  
You exhaustion week 1050100150200250Highcharts.com



## TREARCH\_LINKS

Edited on 7/5/18created on 7/5/18

## WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

## TWEEK1\_GOALSET [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

Thanks for logging your activity at the beginning of the program

Set a Goal for next week?

Think about a goal of physical activity minutes in both aerobic and/or strength training: we'll ask how you went in 7 days time

## TDAYS\_NONE1 [Edit](#) [View](#)

Edited on 21/6/18created on 18/6/18

Today is a benchmark.

While you've not been very active over the last while, it doesn't matter.

What *does* matter is that today marks a change- and that you're going to give physical activity a go over the next month.

Think about what you might like to give a try, and take this change at your own pace.  
Set a goal for next week and we will ask you about it when you check in next time

TDAYS\_FEW [Edit](#) [View](#)

Edited on 21/6/18 created on 18/6/18

You said you were active on {DAYS\_ACTIVE} day(s) in the last week that is great!

This is a benchmark for how you are now and over time you'll be able to compare yourself to where you are down the track.

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 21/6/18 created on 18/6/18

You said you were active on {DAYS\_ACTIVE} in the last week! That's great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)

Edited on 21/6/18 created on 18/6/18

You said you were active on {DAYS\_ACTIVE} days in the last week! That's great, keep up the good work, and get active on as many days as you can

TDAYS\_NONE [Edit](#) [View](#)

Edited on 21/6/18 created on 19/6/18

Today is a benchmark.

- While you've not been heaps active over the last while, it doesn't matter.  
What *does* matter is that today marks a change- and that you're going to give physical activity a go over the next month.
- Think about what you might like to give a try, and take this change at your own pace.

- Set a goal for next week and we will ask you about it next time you check in

Tconclusion [Edit](#) [View](#)

Edited on 26/7/18created on 26/7/18

Feel free to check out the exercise videos in the library section of the site in this program

### Exercise Videos: Follow along at home

Click on the links and it will take you to a youtube video tutorial.



## Physical Activity Log Week 2

### Goal 1

#1

Last week we asked you to set a goal.

Did you meet your goal in last week?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

### PA MVPA intro

#2

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

### AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### MOD MINS 2

#3

Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

VIG MINS 2

#4

Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shoveling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skiping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES SESS 2

#5

**Jumps** to 8



### RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of training in which you are working against some type of force that resists your body movements.	Repeated shoveling in the garden Specific exercises, for example Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises
Resistance bands	Lunges
Weights	Step-ups
Your own body	Calf raises
They are designed to build up muscle, strength, endurance and power.	Core bracing Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

### RES EXEC 2

#6

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

## RESS EXHAUST 2

#7

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

## DAYS ACTIVE 2

#8

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

## *Physical Activity Log 2 Algorithms*

```
$fbbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show('TINTRO_PA_LOG2', $fbbackGroups);  
if ($Goal_1 == 1) show('TGOAL1_MORE', $fbbackGroups);  
if ($Goal_1 == 2) show('TGOAL1_SAME', $fbbackGroups);  
if ($Goal_1 == 3) show('TGOAL1_SOSO', $fbbackGroups);  
if ($Goal_1 == 4) show('TGOAL1_HARD', $fbbackGroups);  
if ($Goal_1 == 5) show('TGOAL1_NOGOAL', $fbbackGroups);  
if ($DAYS_ACTIVE_2 == 0) show ('TDAYS_NONE', $fbbackGroups);  
if ($DAYS_ACTIVE_2 >= 1 && $DAYS_ACTIVE_2 < 2 ) show ('TDAYS_FEW',  
$fbbackGroups);  
if ($DAYS_ACTIVE_2 >= 3 && $DAYS_ACTIVE_2 < 5 ) show ('TDAYS_SOME',  
$fbbackGroups);  
if ($DAYS_ACTIVE_2 >= 5) show ('TDAYS_LOTS', $fbbackGroups);  
show('TMVPA_2_GRAPH', $fbbackGroups);  
show('TRESS_SESS_2', $fbbackGroups);  
show('TRESS_EX_2', $fbbackGroups);  
show('TRESS_EXHAUST_2', $fbbackGroups);  
show('TREARCH_LINKS', $fbbackGroups);
```

## *Physical Activity Log 2 Feedback*

TINTRO\_PA\_LOG2 [Edit](#) [View](#)

Edited on 19/6/18 created on 10/5/18

Welcome back to the physical activity log

### WEEK 2

Think about any changes and goals for the next week,

Come back in 7 days and we'll ask you how you felt you went

If you haven't already, check out the library for exercise video examples

Click "next" to find out more

### T\_PHYSICAL ACTIVITY LOG

#### Cardio Minutes

Lets look at your level of activity

We will compare your levels from last week and this week.

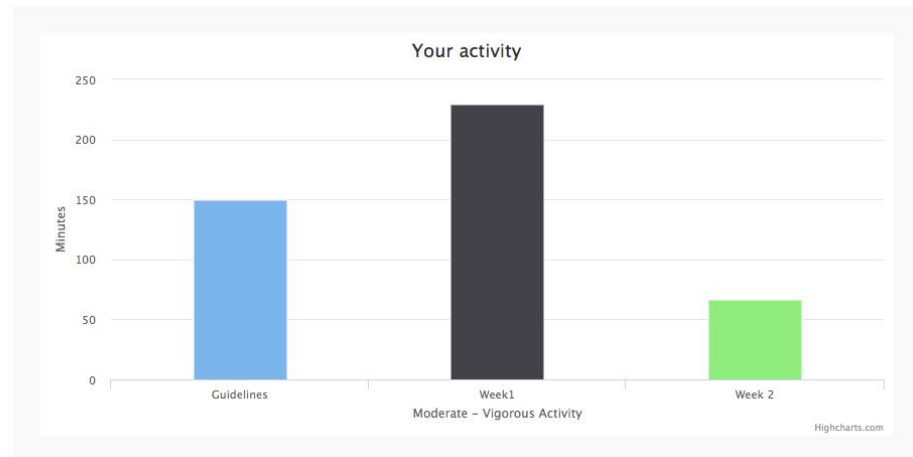
Moderate - Vigorous ActivityMinutesYour activityWeek1Week

2050100150200250300350Highcharts.com

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last week and this week.



TRESS\_SESS\_2 [Edit](#) [View](#)

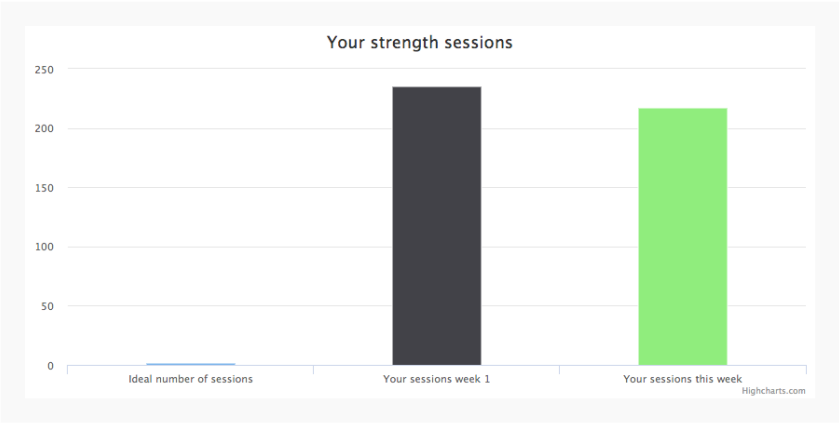
Edited on 21/6/18 created on 3/5/18

Lets have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

Your strength sessions  
Ideal number of sessions  
Your sessions week 1  
Your sessions this week  
050100150200250  
Highcharts.com

Lets have a look at your strength (resistance) training levels-  
Pick a goal for next week and we'll ask you about it



TRESS\_EX\_2 [Edit](#) [View](#)

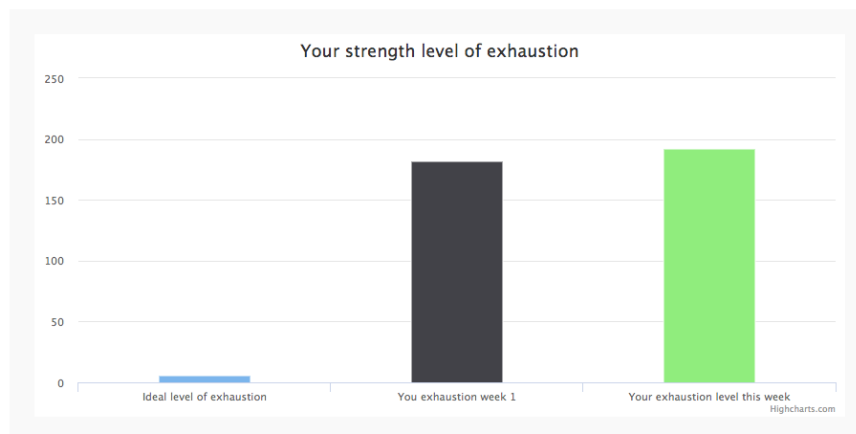
Edited on 8/5/18created on 3/5/18

Your strength number of exercisesIdeal number of exercisesYou number of exercises  
week 1Your number of exercises this week050100150200250300Highcharts.com



TRESS\_EXHAUST\_2 [Edit](#) [View](#)

Edited on 19/6/18created on 3/5/18



Your strength level of exhaustion  
Ideal level of exhaustion  
You exhaustion week 1  
Your exhaustion level this week  
050100150200250  
Highcharts.com

TGOAL1\_MORE [Edit](#) [View](#)

Edited on 10/5/18 created on 10/5/18

Let's look at your goals and activity for this week

Well done meeting your goal! You're doing really well, keep going and adjust that goal up to increase you're activity to meet your goal for the next week

TGOAL1\_SAME [Edit](#) [View](#)

Edited on 10/5/18 created on 10/5/18

Let's look at your goals and activity for this week

Well done on your goal for the first week! You're doing really well, keep going in the direction that you feel that your going in- if its working for you, keep doing it for your goal next week

TGOAL1\_SOSO [Edit](#) [View](#)

Edited on 19/7/18 created on 10/5/18

Let's look at your goals and activity for this week

Looks like things were a bit tricky for you this week meeting your goal. Have a think about adjusting your goal:

Is it achieve able for you at the moment?

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TGOAL1\_HARD [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Tricky week?

Looks like things were a bit tricky for you this week

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TGOAL1\_NOGOAL [Edit](#) [View](#)

Edited on 21/6/18created on 10/5/18

You said you didn't set a goal for your activity last week: we strongly recommend you give it a go.

Why? Goals give something to aim for, and gives a good feeling when we reach it. The research shows that those who make goals tend to have better outcomes.

Lets look at your activity levels for this week

TDAYS\_FEW [Edit](#) [View](#)

Edited on 21/6/18created on 10/5/18

You said you were active on {DAYS\_ACTIVE\_2} day(s) in the last week, good work.

Keep going at your own pace

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 21/6/18created on 10/5/18

You said you were active {DAYS\_ACTIVE\_2} days in the last week! That's great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)



Edited on 21/6/18created on 10/5/18

You said you were active {DAYS\_ACTIVE\_2} days in the last week! That's great, keep up the good work, and get active on as many days as you can

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

See you next week: good luck meeting your goal

TDAYS\_NONE [Edit](#) [View](#)

Edited on 21/6/18created on 21/6/18

- Looks like this week was a little difficult for you in terms of activity, but that's ok- don't beat yourself up.
- Have a think about *why* things were hard for you, and brainstorm some ways you think you might be able to get around some of the problems
- What do you think is manageable for you? Can you be active on one or more days in the next week of the program

## *Physical Activity Log Week 3*

### Goal 2

#1

Last week we asked you to set a goal.

Did you meet your goal in last week?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

### PA MVPA intro

#2

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

### AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### MOD MINS 3

#3

### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

VIG MINS 3

#4

Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skipping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES SESS 3

#5

**Jumps** to 8

RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also	Repeated shoveling in the garden

known as strength training, is a form of training in which you are working against some type of force that resists your body movements.	Specific exercises, for example Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges Step-ups Calf raises Core bracing Elastic/ theraband exercises
Resistance bands	
Weights	
Your own body	
They are designed to build up muscle, strength, endurance and power.	

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES EXEC 3

#6

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

RESS EXHAUST 3

#7

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

DAYS ACTIVE 3

#8

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

### *Physical Activity Log 3 Algorithms*

```
$fbbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show('TINTRO_PA_LOG3', $fbbackGroups);  
if ($Goal_2 == 1) show('TGOAL2_MORE', $fbbackGroups);  
if ($Goal_2 == 2) show('TGOAL2_SAME', $fbbackGroups);  
if ($Goal_2 == 3) show('TGOAL2_SOSO', $fbbackGroups);  
if ($Goal_2 == 4) show('TGOAL2_HARD', $fbbackGroups);  
if ($Goal_2 == 5) show('TGOAL2_NOGOAL', $fbbackGroups);  
if ($DAYS_ACTIVE_3 == 0) show ('TDAYS_NONE', $fbbackGroups);  
if ($DAYS_ACTIVE_3 >= 1 && $DAYS_ACTIVE_3 < 2 ) show ('TDAYS_FEW',  
$fbbackGroups);  
if ($DAYS_ACTIVE_3 >= 3 && $DAYS_ACTIVE_3 < 5 ) show ('TDAYS_SOME',  
$fbbackGroups);  
if ($DAYS_ACTIVE_3 >= 5) show ('TDAYS_LOTS', $fbbackGroups);  
show('TMVPA_3_GRAPH', $fbbackGroups);  
show('TRESS_SESS_3', $fbbackGroups);  
show('TRESS_EX_3', $fbbackGroups);  
show('TRESS_EXHAUST_3', $fbbackGroups);  
show('TREARCH_LINKS', $fbbackGroups);
```

### *Physical Activity Log 3 Feedback*

TINTRO\_PA\_LOG3 [Edit](#) [View](#)

Edited on 19/6/18 created on 10/5/18

Welcome back to the physical activity log

#### WEEK 3

Think about any changes and goals for the next week,

Come back in 7 days and we'll ask you how you felt you went

If you haven't already, check out the library for exercise video examples

Have you looked at the modules?

Feel free to check out the ask an expert section too

Let's look at your activity for this week: please click 'next'

TMVPA\_3\_GRAPH [Edit](#) [View](#)

Edited on 31/7/18 created on 7/5/18

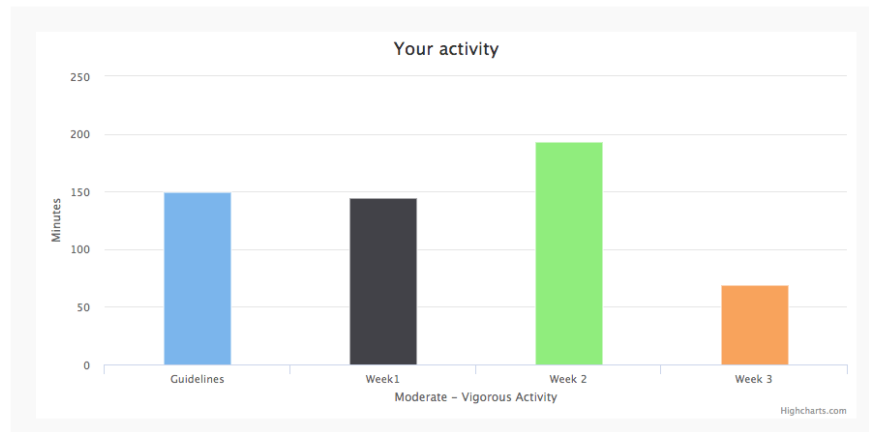
Let's look at your level of activity

We will compare your levels from last two weeks and this week.

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last two weeks and this week



Moderate - Vigorous ActivityMinutesYour activityWeek1Week 2Week

30100200300400Highcharts.comWeek 3● Series 1: 299

TRESS\_SESS\_3 [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

Let's have a look at your strength (resistance) training levels-

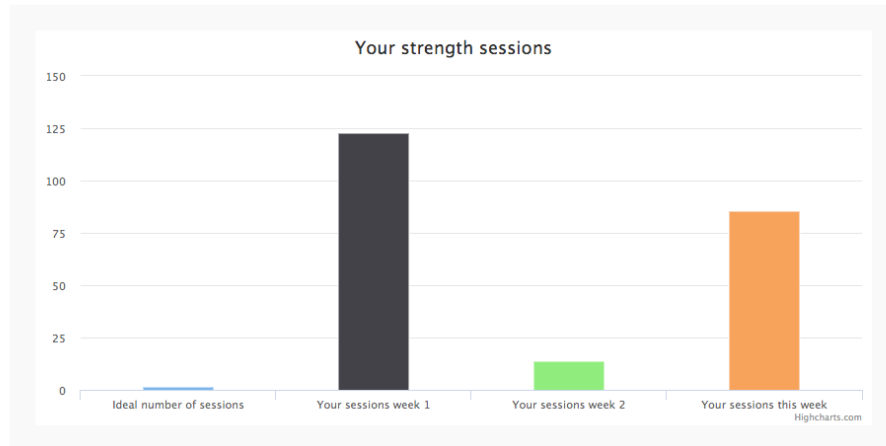
Pick a goal for next week and we'll ask you about it

Strength Training Week 1Ideal number of sessionsYour sessions week 1Your sessions

week 2Your sessions this week050100150200250300Highcharts.com



Lets have a look at your strength (resistance) training levels-  
Pick a goal for next week and we'll ask you about it



TRESS\_EX\_3 [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

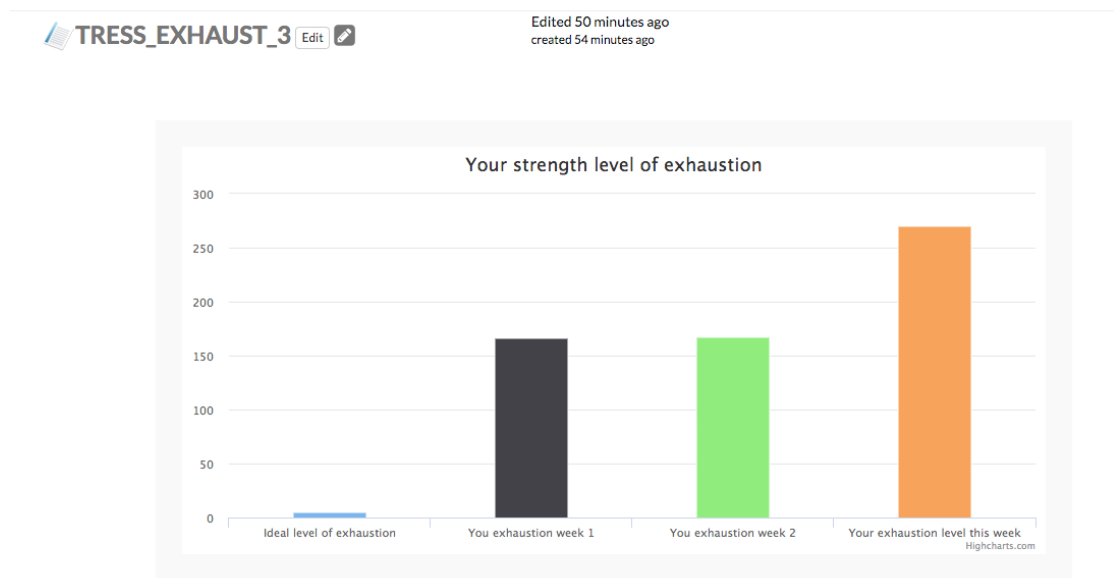
Strength Training Week 1Ideal number of exercisesYou number of exercises week  
1Your number of exercises week 2Your number of exercises week  
3050100150200250300Highcharts.com



TRESS\_EXHAUST\_3 [Edit](#) [View](#)

Edited on 19/6/18created on 7/5/18

Strength Training Week 1Ideal level of exhaustionYou exhaustion week 1Your  
exhaustion week 2Your exhaustion this week050100150200250300Highcharts.com



Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

TGOAL2\_MORE [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Let's look at your goals and activity for this week

Well done meeting your goal! You're doing really well, keep going and adjust that goal up to increase you're activity to meet your goal for the next week

TGOAL2\_SAME [Edit](#) [View](#)

Edited on 30/7/18created on 10/5/18

Let's look at your goals and activity for this week

Well done on your goal for this week! You're doing really well, keep going in the direction that you feel that your going in- if its working for you, keep doing it for your goal next week

TGOAL2\_SOSO [Edit](#) [View](#)

Edited on 28/5/18created on 10/5/18

Let's look at your goals and activity for this week

Looks like things were a bit tricky for you this week meeting your goal. Have a think about adjusting your goal:

Is it achieve able for you at the moment?

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TGOAL2\_NOGOAL [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

You said you didn't set a goal for your activity last week: we strongly recommend you give it a go.

Why? Goals give something to aim for, and gives a good feeling when we reach it. The research shows that those who make goals tend to have better outcomes.

TGOAL2\_HARD [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Tough week?

Looks like things were a bit tricky for you this week

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

WANT TO LEARN MORE?

## *Physical Activity Log 4*

### Goal 3

#1

Last week we asked you to set a goal.

Did you meet your goal in last week?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

### PA MVPA intro

#2

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

### AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### MOD MINS 4

#3

### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

VIG MINS 4

#4

Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skiping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES SESS 4

#5

**Jumps** to 8

RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of	Repeated shovelling in the garden Specific exercises, for example

training in which you are working against some type of force that resists your body movements.	Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges Step-ups Calf raises Core bracing Elastic/ theraband exercises
Resistance bands	
Weights	
Your own body	
They are designed to build up muscle, strength, endurance and power.	

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES\_EXEC\_4

#6

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

RESS\_EXHAUST\_4

#7

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

DAYS\_ACTIVE\_4

#8

Jumps to end

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

### *Physical Activity Log 4 Algorithms*

```
$fbackGroups = ['FREE', 'FINISHEDCONTROL'];  
show('TINTRO_PA_LOG4', $fbackGroups);  
if ($Goal_3 == 1) show('TGOAL3_MORE', $fbackGroups);  
if ($Goal_3 == 2) show('TGOAL3_SAME', $fbackGroups);  
if ($Goal_3 == 3) show('TGOAL3_SOSO', $fbackGroups);  
if ($Goal_3 == 4) show('TGOAL3_HARD', $fbackGroups);  
if ($Goal_3 == 5) show('TGOAL3_NOGOAL', $fbackGroups);  
if ($DAYS_ACTIVE_4 <= 2) show('TDAYS_FEW', $fbackGroups);  
if ($DAYS_ACTIVE_4 > 2 && $DAYS_ACTIVE_4 < 5) show ('TDAYS_SOME',  
$fbackGroups);  
if ($DAYS_ACTIVE_3 >= 5) show ('TDAYS_LOTS', $fbackGroups);  
show('TMVPA_4_GRAPH', $fbackGroups);  
show('TRESS_SESS_4', $fbackGroups);  
show('TRESS_EX_4', $fbackGroups);  
show('TRESS_EXHAUST_4', $fbackGroups);  
show('TREARCH_LINKS', $fbackGroups);  
show('TLT_CONCLUSION', $fbackGroups);
```



## *Physical Activity Log 4 Feedback*

TINTRO\_PA\_LOG4 [Edit](#) [View](#)

Edited on 24/7/18 created on 10/5/18

Welcome back to the physical activity log

This is the final week of the program: MAKE IT COUNT

Welcome to the final physical activity log

Have think about any changes and goals for the next week,

If you haven't already, feel free to take a look at:

Our library for exercise video examples and articles

The "ask an expert" section

Any modules you haven't had a chance to yet modules

TMVPA\_4\_GRAPH [Edit](#) [View](#)

Edited on 31/7/18 created on 10/5/18

Cardio minutes of activity

Let's look at your level of activity

We will compare your levels from last three weeks and this week

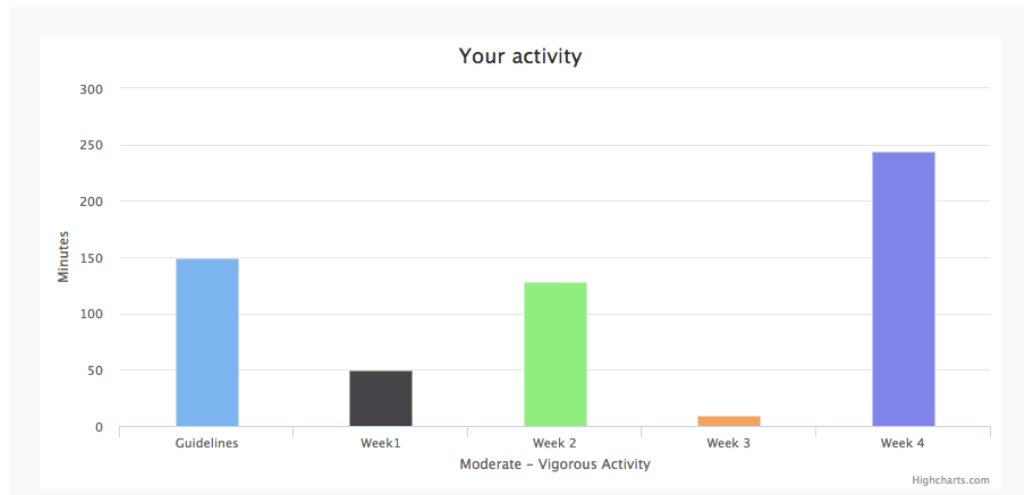
Moderate - Vigorous ActivityMinutesYour activityWeek1Week 2Week 3Week

4050100150200250300Highcharts.comWeek 4● Series 1: 193

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last three weeks and this week



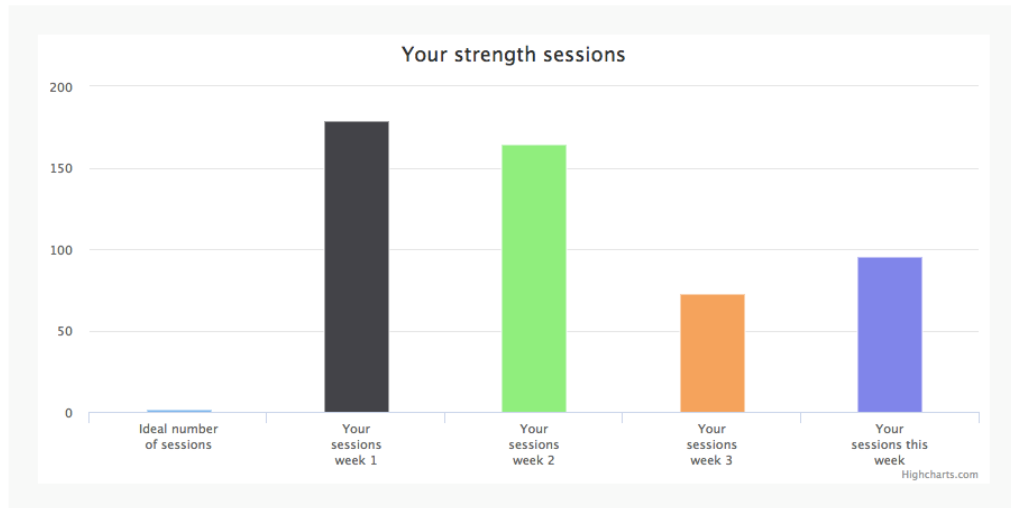
TRESS\_SESS\_4 [Edit](#) [View](#)

Edited on 10/5/18 created on 10/5/18

Lets have a look at your strength (resistance) training levels -

Your strength sessions  
Ideal number of sessions  
Your sessions week 1  
Your sessions week 2  
Your sessions week 3  
Your sessions this week  
050100150200250300  
Highcharts.com

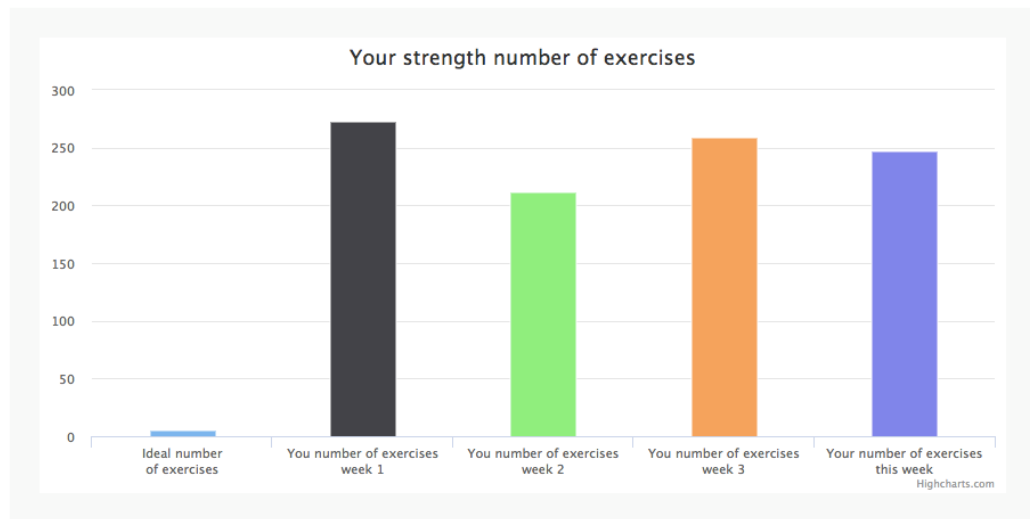
Lets have a look at your strength (resistance) training levels -



TRESS\_EX\_4 [Edit](#) [View](#)

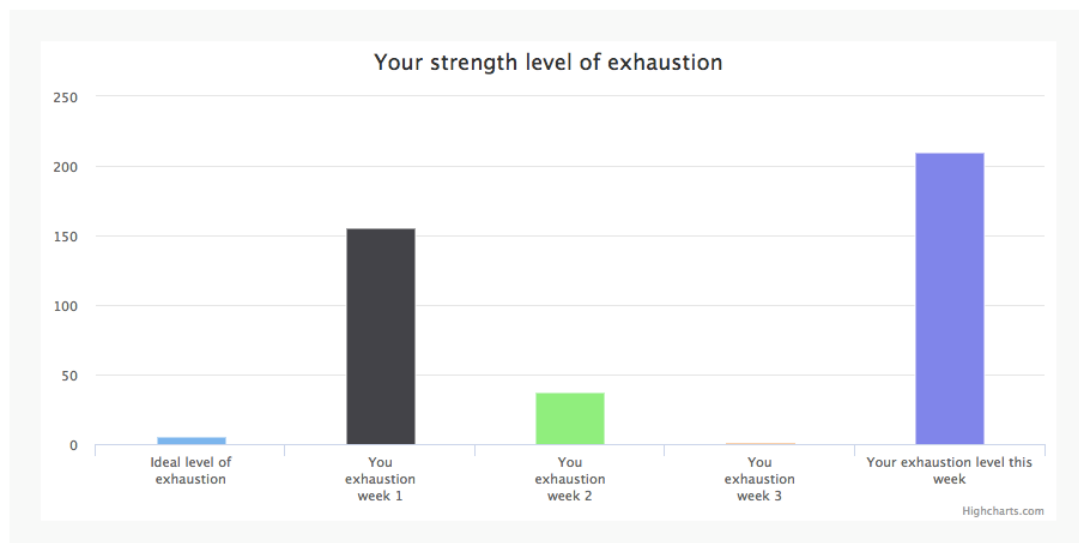
Edited on 10/5/18created on 10/5/18

Your strength number of exercisesIdeal number of exercisesYou number of  
exerciseweek 1You number of exerciseweek 2You number of exerciseweek 3Your  
number of exercisesthis week050100150200250300Highcharts.com

TRESS\_EXHAUST\_4 [Edit](#) [View](#)

Edited on 19/6/18created on 10/5/18

Your strength level of exhaustionIdeal level of exhaustionYou exhaustion week 1You  
exhaustion week 2You exhaustion week 3Your exhaustion level  
thisweek0255075100125Highcharts.com



TDAYS\_FEW [Edit](#) [View](#)

Edited on 30/7/18created on 10/5/18

You said you were active on {DAYS\_ACTIVE\_3} days in the last week but to get to the best that your body can be you'll have to try to move a bit on as many days as you can. Think about a goal for how many days you think you'll be able to do this coming week

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 30/7/18created on 10/5/18

You said you were active {DAYS\_ACTIVE\_3} days on in the last week! Thats great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)

Edited on 30/7/18created on 10/5/18

You said you were active {DAYS\_ACTIVE\_3} days on in the last week! That's great, keep up the good work, and get active on as many days as you can

TGOAL3\_MORE [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Let's look at your goals and activity for this week

Well done meeting your goal! You're doing really well, keep going and adjust that goal up to increase your activity over time.

TGOAL3\_SAME [Edit](#) [View](#)

Edited on 28/5/18created on 10/5/18

Let's look at your goals and activity for this week

Well done on your goal for the previous week! You're doing really well, keep going in the direction that you feel that your going in- if its working for you, keep doing it

TGOAL3\_SOSO [Edit](#) [View](#)

Edited on 28/5/18created on 10/5/18

Tricky week?

Looks like things were a bit tricky for you this week meeting your goal. Have a think about adjusting your goal:

Is it achieve able for you at the moment?

We suggest adjusting your goal, start smaller and build up to bigger goals over time

Try asking our expert about your goals in the "Ask an Expert" section of the website

TGOAL3\_NOGOAL [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Let's look at your goals and activity for this week

You said you didn't set a goal for your activity last week: we strongly recommend you give it a go into the future.

Why?

Goals give something to aim for, and gives a good feeling when we reach it.

The research shows that those who make goals tend to have better outcomes.

TLT\_CONCLUSION [Edit](#) [View](#)

Edited on 24/7/18created on 10/5/18

Thank you for completing the last physical activity log

This is your last week: MAKE IT COUNT

As part of the research, you will need to complete the follow-up *research* survey in **7 days time**

- this will have similar questions to the one you filled out at the beginning of the program
- this will ask you about how you found the website and give you a chance to give feedback

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

TGOAL3\_HARD [Edit](#) [View](#)

Edited on 28/5/18created on 28/5/18

Let's look at your goals and activity for this week

Looks like things were a bit tricky for you this week

We suggest adjusting your goal, start smaller and build up to bigger goals over time

Try asking our expert about your goals in the "Ask an Expert" section of the website

## ***Appendix B: Standard Tunnel Module Concept Book***

### ***Module 1: Getting Started + Physical Activity Log 1***

**#1**

#### **Welcome to Prostate Cancer Health and Fitness Online**

Designed for prostate cancer survivors- PCHF aims to give you more tools in your toolkit to improve your health and fitness.

**We'd like to ask you some questions before we show you the main content.**

Why?

Everyone is different and the advice we offer to you may not be suitable to someone else

The questions you answer will help us provide information relevant to you.

#### **AGE**

**#2**

**How old are you?**

#### **PA MVPA intro**

**#3**

Physical Activity

We are looking at 2 types of activity you may have done this week.

1) Aerobic or cardio based activity

2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

#### **AEROBIC ACTIVITY**

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.



The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### **MOD MINS 1**

**#4**

#### **Moderate activity**

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

### **VIG MINS 1**

**#5**

#### **Vigorous Activity**

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skippping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

## RES\_SESS 1

#6

**Jumps** to 9

### RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of training in which you are working against some type of force that resists your body movements. Resistance bands Weights Your own body They are designed to build up muscle, strength, endurance and power.	Repeated shovelling in the garden Specific exercises, for example Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges Step-ups Calf raises Core bracing Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

## RES\_EXEC 1

#7

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

### **RESS EXHAUST 1**

#8

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

We will apply to same graph to resistance training

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

### **DAYS ACTIVE**

#9

**How many days were you active?**

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

### **PA FEEL 1**

#10

Pick an answer that best summarises how you feel about exercise

☐

I enjoy exercise

☐ I don't enjoy it but I should do it

**Health functional**

**#11**

**Jumps** to end

Do you have any health conditions that have a functional impact on your capacity to be active?

Soreness? Pain? Limited walking? Out of breath?

☐ No

☐ Sometimes

☐ Yes

## *Module 1: Getting Started + Physical Activity Log 1 Algorithms*

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## *Module 1: Getting started + Physical activity log 1 Feedback*

TPROGRAM\_INTRO [Edit](#) [View](#)

Edited on 19/6/18 created on 19/6/18

{user\_firstname}, let's have a look at some tailored advice to you

Exercise guidelines for prostate cancer survivors

Working towards **150min of moderate to vigorous activity and 2 strength sessions a week**

The guidelines state that those with cancer should consult with an exercise physiologist or physiotherapist

Think about exercising at the same time, the same place, and same days to start to build in habits

Learn more about the 2018 updated guidelines for Australian's with a history of cancer by clicking on the link

([https://www.mja.com.au/system/files/issues/209\\_06/10.5694mja18.00199.pdf](https://www.mja.com.au/system/files/issues/209_06/10.5694mja18.00199.pdf) )

Why strength training too?

Often prostate cancer survivors who have had hormone treatment get told about muscle wastage and are given the advice to do strength training

BUT... strength training is important for **all prostate cancer survivors**

**WHY?** Keeping your muscles strong is important as you age. Stronger muscles mean you can lift, pull, push or get out of bed with ease for as long as you possibly can

Click 'next' to find out more health messages specific to you

TINTRO\_AGE\_OVER65

Edited on 18/6/18 created on 30/4/18

Make the most of the body you have

**FITNESS**

**STRENGTH**

**FLEXIBILITY**

As we age, our bodies do tend to not be what they used to be at 25- but that's no reason to make the most of what you have

**Men over the age of 65 should be active every day in as many ways as possible,**

doing a range of physical activities that involve different parts of your body

- Start with small changes; if you try to go too hard too fast, it may cause a bit of muscle soreness to your body.
- See our frequently asked question section in our “Ask an Expert” to learn more about muscle soreness
- Take into account your aches and pains: if they get worse, see a professional about how to become more physically active while looking after your body
- Variety is the spice of life: It is also important to incorporate fitness, strength, balance and flexibility into your life too, keep exercise interesting.

TPA\_FEEL\_OK [Edit](#) [View](#)

Edited on 21/6/18 created on 30/4/18

Enjoy exercise? Then let's move!

It is great that you have already found exercise that you like doing.

Keep doing exercises that you enjoy over the next month. It is much easier to stick to an enjoyable routine.

If we recommend exercises that you don't enjoy so much, you might need to remind yourself of why you are trying them (e.g., to build strength you wouldn't otherwise build).

You probably already have good strategies to up your enjoyment (e.g. listen to music, find a podcast or audiobook do it with a friend). Keep this up, it will help with motivation.

TPA\_FEEL\_GUILTY [Edit](#) [View](#)

Edited on 21/6/18 created on 30/4/18

Feeling guilty about not moving as much as you think you ought to?

While guilt and shame can be useful at motivating us, the evidence points out that guilt and shame don't usually work in the long term for changing health behaviours.

If guilt is a key motivator for you, consider why this is the case.

Enjoyment is a better motivator for exercise than guilt in the long run. It is much easier to stick to an enjoyable routine than one we do because we think we should. With that in mind, we suggest you let go of guilt.

Think about it like this: The best time to plant a tree was 20 years ago, the best we can do now is to start today.

In the same way, don't dwell on the past, and try not to beat yourself up - let's think about what you need to do from now on.

**Focus on enjoyment. A big part of this is taking changing your exercise behaviour at your own pace.** We will provide you with information about what is needed to squeeze the most benefits out of exercise, and you can decide how and when you do this.

If we recommend exercises that you don't enjoy so much, reminding yourself of why you are trying them (e.g., to build strength you wouldn't otherwise build) is ok, but we also suggest trying strategies to up your enjoyment too (e.g. listen to music, find a pod cast or audio book, do it with a friend etc.)

TPA\_OUTCOME\_EXPECTATIONS [Edit](#) [View](#)

Edited on 30/7/18 created on 30/4/18

What are the benefits of exercise?

strengthen muscles and bones and improve circulation,



help you maintain or achieve a healthy weight,  
improve your energy levels,  
improve your mobility and balance,  
improve appearance and self-esteem,  
help you cope with stress, anxiety and depression.

It can also reduce the risk of (or help to manage):

high blood pressure,  
heart disease,  
stroke,  
diabetes,  
osteoporosis  
and some cancers

**Is there anything else we have missed that you can think of? Can you think of other benefits that are specific to your life?**

TDAYS\_FEW [Edit](#) [View](#)

Edited on 19/6/18 created on 1/5/18

You said you were active on {DAYS\_ACTIVE} day(s) in the last week that is great!

This is a benchmark for how you are now and over time you'll be able to compare yourself to where you are down the track.

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 19/6/18 created on 1/5/18

You said you were active on {DAYS\_ACTIVE} days during the last week! That's great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)

Edited on 19/6/18 created on 3/5/18

You said you were active on {DAYS\_ACTIVE} days in the last week! That's great, keep up the good work, and get active on as many days as you can

TINTRO\_AGE\_UNDER65 [EditView](#)

Edited on 28/5/18created on 3/5/18

Make the most of the body you have

FITNESS

STRENGTH

FLEXIBILITY

As we age, our bodies do tend to not be what they used to be at 25- but that's no reason to make the most of what you have

Men under 65 should be **active every day in as many ways as possible**, doing a range of physical activities that involve different parts of your body

Start with small changes; if you try too go to hard too fast, it may cause a bit of muscle soreness to your body.

See our frequently asked question section in our "Ask an Expert" to learn more about muscle soreness

Take into account your aches and pains: if they get worse, see a professional about how to become more physically active while looking after your body

Variety is the spice of lie: It is also important to incorporate fitness, strength, balance and flexibility into your life too, keeps exercise interesting as well as meeting different needs of your body

Aim to start to work towards the cancer guidelines of 150min of moderate to vigorous activity and 2 strength sessions a week

Think about exercising at the same time, the same place, and same days to start building in habits

TMVPA\_1\_GRAPH

Edited on 19/7/18created on 7/5/18

Minutes of Moderate and Vigorous Activity

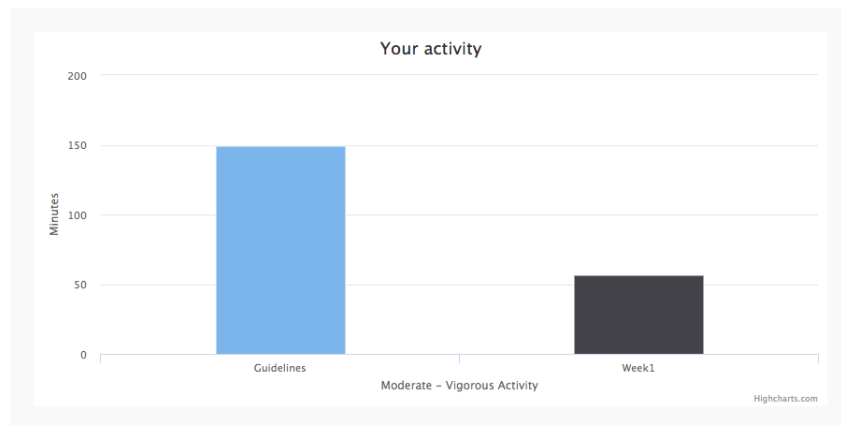
This is your baseline- something to work from

Moderate - Vigorous ActivityMinutesYour

activityWeek1020406080100Highcharts.com

## Minutes of Moderate and Vigorous Activity

- Cardio / aerobic activity



TRESS\_SESS\_1

Edited on 21/6/18 created on 7/5/18

Lets have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

Strength Training Week 1 Ideal number of sessions

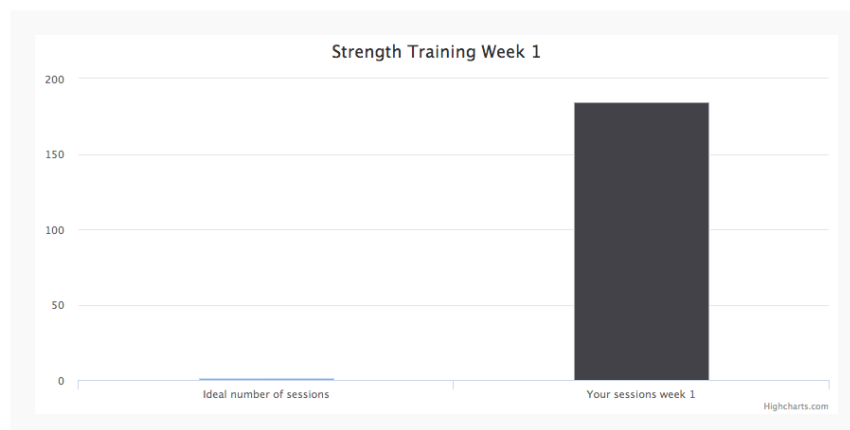
Your sessions week 1050100150200250300Highcharts.com

TRESS\_SESS\_1 [Edit](#)

Edited 33 minutes ago  
created 33 minutes ago

Lets have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

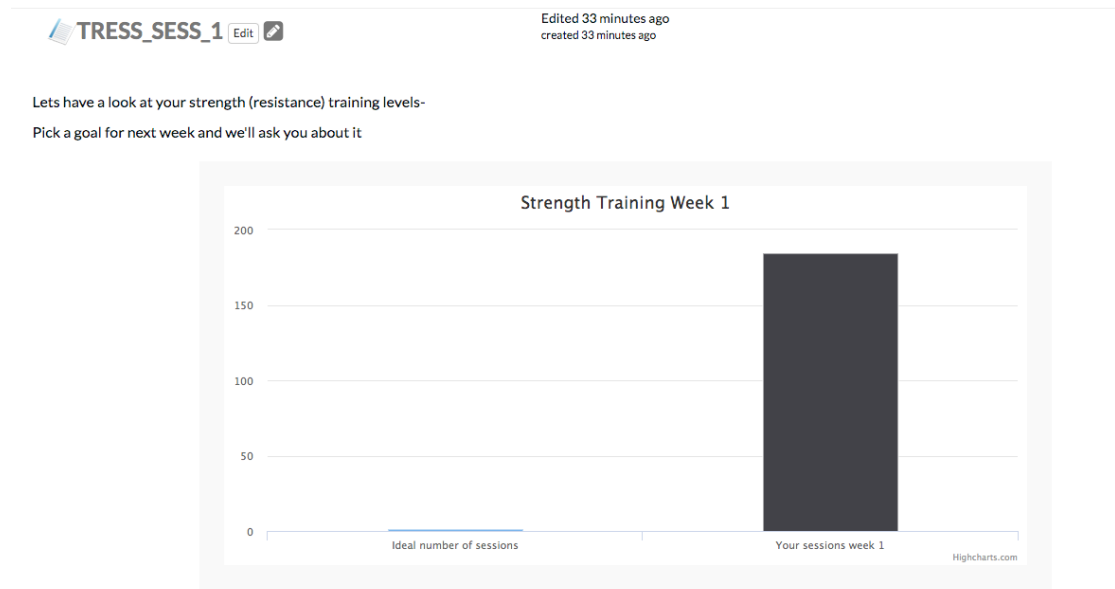


TRESS\_EX\_1

Edited on 7/5/18created on 7/5/18

Strength Training Week 1Ideal number of exercisesYou number of exercises week

1050100150200250300350Highcharts.com

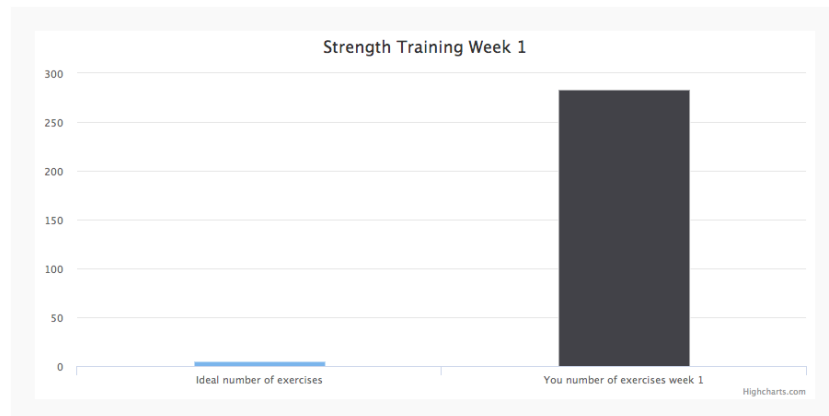


TRESS\_EXHAUST\_2

Edited on 19/6/18created on 7/5/18

Strength Training Week 1Ideal level of exhaustion

You exhaustion week 1050100150200250Highcharts.com



TINTRO\_AGE\_UN65 [Edit](#) [View](#)

Edited on 19/6/18 created on 7/5/18

Make the most of the body you have

**FITNESS**

**STRENGTH**

**FLEXIBILITY**

As we age, our bodies do tend to not be what they used to be at 25- but that's no reason to make the most of what you have

Men under 65 should be **active every day in as many ways as possible**, doing a range of physical activities that involve different parts of your body

Start with small changes; if you try to go too hard too fast, it may cause physical damage to your body.

Take into account your aches and pains: if they get worse, see a professional about how to become more physically active while looking after your body

It is also important to incorporate fitness, strength, balance and flexibility into your life too

Think about exercising at the same time, the same place, and same days to start building habits

TWEEK1\_GOALSET [Edit](#) [View](#)

Edited on 18/6/18 created on 7/5/18

Thanks for completing Module 1

Set a Goal for next week?

Think about a goal for the coming week in terms of your physical activity: we'll ask how you went in 7 days time

TFUNCTION\_IMPACT\_Y [EditView](#)

Edited on 28/6/18 created on 18/6/18

Your health status

You said that other aspects of your health impact your ability to be active.

It's important that you work within your limitations and go at your own pace

If things get a bit tricky (in too much pain, want advice about adapted exercises to take into account your health conditions) you could

- Chat with our expert by sending Holly an email.
- Chat to your GP about your limitations and exercise and ask for advice
- Find an exercise professional near you
- Finding an exercise physiologist <https://www.essa.org.au/find-aep/>
- Finding a  
physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

TFUNCTION\_IMPACT\_N [EditView](#)

Edited on 21/6/18 created on 18/6/18

You said that other aspects of your health don't tend to impact your ability to be active.

It's important that you work within your limitations and go at your own pace

If things change you could:

Chat to our expert by sending Holly an email.

Chat to your GP about your limitations and exercise and ask for advice

Find an exercise professional near you

Finding an exercise physiologist <https://www.essa.org.au/find-aep/>

Finding a

physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

x

TFUNCTION\_IMPACT\_S [EditView](#)

Edited on 19/6/18created on 18/6/18

You said that other aspects of your health sometimes impact your ability to be active.

It's important that you work within your limitations and go at your own pace

If things get a bit tricky (in too much pain, want advice about adapted exercises to take into account your health conditions) you could

- Chat to our expert by sending Holly an email.
- Chat to your GP about your limitations and exercise and ask for advice
- Find an exercise professional near you
- Finding an exercise physiologist <https://www.essa.org.au/find-aep/>
- Finding a  
physiotherapist <https://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx>

TDAYS\_NONE [Edit](#) [View](#)

Edited on 21/6/18created on 18/6/18

Today is a benchmark.

While you've not been very active over the last while, it doesn't matter.

What *does* matter is that today marks a change- and that you're going to give physical activity a go over the next month.

Think about what you might like to give a try, and take this change at your own pace.

Set a goal for next week and we will ask you about it when you check in next time

TINTRO\_CONCLUSION [EditView](#)

Edited on 26/7/18 created on 30/4/18

Thank you for completing Module 1

Please come back in 7 days weeks time for the next part of the program

Good luck meeting your goal for this week

Feel free to check out the **exercise videos in the library section** of the website



## *Module 2: Goals and barriers + Physical activity log 2*

### Goal 1

#1

Last week we asked you to set a goal.

Did you meet your goal in last week?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

### BARRIER

#2

**Jumps** to 4,4,4,4,4,4,4,4,4

Most people have at least one thing that makes the likelihood of exercising go down.

Out of the options below, what would you say your **main** barrier is?

- ☐ Out of breath
- ☐ Incontinence
- ☐ Finding time
- ☐ Pain (arthritis, joint, muscle pain)
- ☐ Tired
- ☐ Low motivation
- ☐ Bad weather
- ☐ Finding activity boring
- ☐ Cost
- ☐ No one to exercise with
- ☐ My main barrier is not covered

### Barrier other

#3

What is your main barrier? Can you tell us what strategies you currently use to address it? We will use the information to help us refine the website in the future.



Please tell us about what the main barrier you face is that was not in the list

#### PA MVPA intro

#4

#### Physical Activity

We are looking at 2 types of activity you may have done this week.

1) Aerobic or cardio based activity

2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

#### AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

#### MOD MINS 2

#5

#### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

VIG\_MINS\_2

#6

Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skipping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES\_SESS\_2

#7

**Jumps** to 10

RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of	Repeated shovelling in the garden Specific exercises, for example

training in which you are working against some type of force that resists your body movements.	Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges
Resistance bands	Step-ups
Weights	Calf raises
Your own body	Core bracing
They are designed to build up muscle, strength, endurance and power.	Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES\_EXEC\_2

#8

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

RESS\_EXHAUST\_2

#9

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

DAYS ACTIVE 2

#10

**Jumps** to end

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

## *Module 2: Goals and barriers + Physical activity log 2 Algorithms*

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## *Module 2: Goals and barriers + Physical activity log 2 Feedback*

T\_INTRO [Edit](#) [View](#)

Edited on 31/7/18 created on 30/4/18

Hi {user\_firstname}

Welcome to week 2 of Prostate Cancer Health and Fitness Online

We will take you through goal setting, barriers to activity and feedback to your activity over the last week.

TBARRIERS\_INTRO [Edit](#) [View](#)

Edited on 27/6/18 created on 30/4/18

Thinking of reasons that stop you from increasing your physical activity levels?

### **You're not alone with that!**

Most prostate cancer survivors find things like making the time to exercise, joint and muscle pain, incontinence, being tired, being in a bad mood, having low motivation or having a bad heart or lungs impacts their activity levels.

Let's have a look at some advice for what you said was the biggest barrier in general for you to move more...

TBARRIER\_BREATH [Edit](#) [View](#)

Edited on 27/6/18 created on 30/4/18

Out of breath

You said that a barrier to exercise is getting out of breath quickly. We know it can be pretty frustrating when you're trying to move.

Here are some tips with this in mind:

- Gentle walking, do what you can until you feel that you need to stop, rest, and then give it another burst

- If you have asthma, take your preventer (usually the blue one) 30 min before exercise and bring it with you
- You don't have to do the vigorous activity which makes you huff and puff very quickly, anything helps
- Start slow, if you keep at it, you will be surprised how quickly your body, heart and lungs will get used to it (and it will feel better)
- Yoga, and Ti- chi, and swimming are exercises that have breathing techniques and big fluid movements which assist with breathing

### Where can you get further help?

- Ask Holly (accredited exercise physiologist) using the “Ask an Expert” section of the website
- Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.
- You can find a list of all accredited exercise physiologists working within Australia [here](#) and a list of physiotherapists [here](#)
- <https://www.betterhealth.vic.gov.au/health/HealthyLiving/breathing-problems-and-exercise>
- <http://exerciseismedicine.com.au/wp-content/uploads/2016/11/2014-Chronic-Heart-Failure-FULL.pdf>
- <https://www.asthmaaustralia.org.au/wa/about-asthma/manage-your-asthma/triggers/exercise/exercise-and-asthma>
- <http://www.health.com/asthma/14-best-and-worst-exercises-for-asthma#walking>

TBARRIER\_INCONTINENCE [Edit](#) [View](#)

Edited on 30/7/18 created on 30/4/18

Leaking...

Exercising with incontinence is tricky- here are some tips that might help

- Try fluid movement exercises, such as swimming, yoga or tai-chi: These exercises have reduced bouncing movement and may reduce your risk of leaking.



- Wear a pad if you're going for a walk or doing non-water based-activity: the reality is you might leak and that's ok. It's part of prostate cancer survivorship and the good thing is no one has to know you're wearing one.
- Plan your escape path - Learn where your public toilets are and map out a walk around these
- Exercise from home using home based resistance or aerobic activities. Strength-training, in particular, can be easy to complete at home. There are example exercises in our library.
- You've probably heard it, but you've got to keep going on those pelvic floor muscle activities

### **Where can you get further help?**

- You can ask Holly, our accredited exercise physiologist using the "Ask an Expert" section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.
- Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.
- Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)
- There is an information booklet in our library that describes pelvic floor exercises and self-check tests that you can do.
- If you have severe leaking please talk to your GP.

### **Pelvic Floor Exercises: Retraining your bladder from the Continence Foundation**

You've probably heard it, but you've got to keep going on those pelvic floor muscle activities

Learn how:

Sit or lie down with the muscles of your thighs, buttocks and stomach relaxed. It may be useful to use a hand mirror to watch your pelvic floor muscles as they pull up.

Gently squeeze the ring of muscle around the back passage as if you are trying to stop passing wind. Now relax this muscle. Squeeze and let go a couple of times until you are sure you have found the right muscles. Try not to squeeze your buttocks.

When going to the toilet to empty your bladder, try to stop the stream of urine, then start it again. Do this to learn which muscles are the right ones to use – but only once a week. Your bladder may not empty the way it should if you stop and start your stream more often than that.

#### MORE INFORMATION

<https://www.continence.org.au/pages/pelvic-floor-muscle-exercises.html>

<https://www.continence.org.au/pages/pelvic-floor-men.html>

Prostate cancer Foundation: 1-hour lecture on Men's Continence and Erectile Issues

[https://www.youtube.com/watch?v=ZlCTRhQQ\\_g8](https://www.youtube.com/watch?v=ZlCTRhQQ_g8)

TBARRIER\_TIME [Edit](#) [View](#)

Edited on 31/7/18 created on 30/4/18

Finding time

Finding the time to exercise is tricky. Everyone is busy in different ways and finding ways to get activity automatically into your day, little bits at a time might help

Here are some things that may help you to fit more physical activity into your day:

- Don't worry about finding the closest possible parking space to where you are going. Park a tad further away and walk the rest.
- In the same vein, if you're in the city walk an extra bus or train stop if it is feasible,
- Take the stairs instead of the lift wherever you can.

- Watching TV? Do strength training while you watch. There are some example exercises in our library.
  - Catching up with a friend? Walk and talk or work on something physical together.
  - At work? Find ways to get up from your desk to get water, a cup of tea, fresh air, a lunchtime walk
  - Exercise while dinner is cooking
- 
- By combining exercise with something you were doing anyway, these strategies can help you become more active without taking much time at all.
  - This can be a good start. Though, if you want to really up your exercise and focus on improving strength and fitness you might need to find time to fit in some structured exercise sessions. The best way of doing this is, and making sure you actually do it, is to plan your week in advance and schedule exercise in just as you would any other appointment.
  - There are significant benefits to be had from a 10-minute structured exercise session.
  - If you are not exercising as much as you would like to be, consider when you can fit in 10, 20 or 30 minutes of exercise over the next week and **make an appointment with yourself to do it.**

Have a think about your day- can you prioritise making time to be more active?

TBARRIER\_PAIN [Edit](#) [View](#)

Edited on 27/6/18 created on 30/4/18

Exercising with pain

Exercising with joint, muscle or arthritic pain is frustrating, and we understand its challenging to move more. However, if you don't move at all, your movement will continue to drop over time and it will get harder to use your body.

**Here are some tips for exercising with pain**

- Exercising with joint, muscle or arthritic pain is frustrating, and we understand it's challenging to move more.
- However, **if you don't move at all, your movement will continue to drop over time and it will get harder to use your body.**
- Book in with an exercise physiologist or physio: These people are experts and will help assist movement with pain.
- You can book one your self, or ask your GP for advice and a Chronic Disease Management Plan to get support
- Do what you can, and build up over time. Every little bit counts
- Move for short periods of time, but make it often
- Always warm up and stretch
- Try being in water: hydrotherapy takes the weight out of the equation and can relieve pain.

#### Overweight?

If your joints aren't having to carry as much weight, you can significantly reduce your pain levels. Consider strategies for your diet as well if other aspects aren't working.

#### Where can you get further help?

- You can ask Holly, our accredited exercise physiologist using the “Ask an Expert” section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.
- Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.
- Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)
- Check out these fact sheets
- [Exercising and arthritis](#)

- Exercising with lower back pain
- Exercising with cancer
- Exercising with prostate cancer
- When in pain- should I rest or exercise?

TBARRER\_MOTIVATION [EditView](#)

Edited on 27/6/18 created on 30/4/18

Finding motivation

- We totally get that motivating yourself to do things is hard: especially when you're trying to change behaviour. Ironically, the more you move the more energy and motivation you will have.
- If you have low motivation: there is usually a reason behind it
- Here are some tips to move when you don't feel like it
- Benefits and accountability
- Think about the immediate benefits of activity: a better night's sleep, more energy and feeling less stressed in general
- Make a goal, and find someone who will help to hold you accountable AND STICK WITH IT: Get your doctor on board, your partner, a close friend
- Keep in mind that progress is slow, and that's ok

Plan a rewards

- If I go for a walk with my wife, then I get to be around and chat to her as well as move
- If I get these exercises done, I can watch that movie that I wanted to watch

- If I go for a walk to the coffee shop, I get coffee and a break at the end of it: so my walk has a point to it
- Give yourself some small goals: you need a win so that you feel good about getting something done
- Scared of getting it wrong or that you'll fail at it?
- Don't stress, it's a normal feeling to have when you're facing something different.
- The main thing is that you make small goals for yourself and give it a go
- Don't want to look foolish at the gym? If you do it from home, no one can judge you
- Think of it as beginning to make 'healthy' the default as opposed to the exception

TBARRIER\_WEATHER [EditView](#)

Edited on 27/6/18 created on 30/4/18

Whatever the weather

When the weather isn't nice, its pretty understandable about not wanting exercise. Here are some tips for maintaining activity levels when the weather isn't cutting it.

### **Get the right equipment:**

- Wet weather: Can you purchase a rain jacket? Can your shoes cope in the wet?
- Cold weather: Can you wear the right clothes to walk in the cold?
- Warm weather: Walking in the shade? Breathable clothing? Lots of water?

**Changing your thoughts:** The way we think about the weather can change our behavior

Think about if you can cope if you get cold/ wet or hot and sweaty? Can you come home after 20min, have a shower and get changed?

Can you exercise if it is unpleasant: knowing you can come home in just a bit?

### **Exercise from home is a great way to move more when the weather is terrible**

- Waiting for the kettle to boil? Try pacing around the kitchen, doing some arm or calf raises while you wait
- Watching TV? Walk around the house during the ad break or do strength training while you watch
- Do some strength exercises at home: **check out the videos in the library for ideas**
- Do the dishes, or clean out a cupboard
- Cleaning burns calories too!
- Did you dance when you were younger?
- Put your favourite music on that makes you want to move,
- No one can see you so just do what you want to

### **Where can you get further help?**

- You can ask Holly, our accredited exercise physiologist using the “Ask an Expert” section of the website
- Book in to see an accredited exercise physiologist or physiotherapist. They are well qualified to help you design an exercise routine that you are comfortable with, and can also guide you through pelvic floor exercises that should help to improve your bladder control.
- Or, you can book one yourself for a face to face consultation: Ask your GP for advice and Chronic Disease Management Plan to get support.
- Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)

TBARRIER\_TIRED [Edit](#) [View](#)

Edited on 27/6/18 created on 30/4/18

When you're tired...

Exercising when you're tired and lethargic is hard, this is a common feeling felt by many prostate cancer survivors. Ironically, the more you move the more energy you will have.

Cancer-related fatigue (CRF): CRF is pretty common, especially in those who are closer to their treatment.

Check out the fact sheet [here](#) about cancer-related fatigue

Exercising tips for tired men...

- As tempting as it is to have a nap on the couch- you have to move
- Do the "5" min test. Try walking or doing something active for just 5 minutes: you might find that starting was the hard part, but you also have permission to stop after 5 min if its just not happening
- If timing exercise isn't your thing, adjust how exhausted you feel instead using the exhaustion measure (it's in the library)
- Go for a gentle walk: it doesn't have to be vigorous activity
- Try gentle swimming
- Build exercise into your routine, when it's in there it will make it easier to do even if you're tired
- Build in rewards, if you go for a walk to the coffee shop, you can meet up with your mate

Get more sleep

- Have a think about your sleeping patterns at the moment.
- Do you snore most nights? Sometimes snoring can be linked to more serious sleeping issues
- If sleep is a problem, take a look at your sleeping patterns and talk to your doctor

TBARRIER\_BORING [Edit](#) [View](#)



Edited on 27/6/18created on 30/4/18

### Make exercise more enjoyable

- Find exercise boring? You're not alone! Lots of people don't exercise as the idea of walking on a treadmill with daytime television the most boring thing in the world
- Tips for making things a little less boring
- Think about what you did as a kid- what did you find fun? Was it games, and being with friends? Was it getting outdoors? Draw on this if you can.
- Set yourself challenges, track your progress and pick a 'trophy'. Better health might be reward enough but some people find having something else to work towards extra motivating (e.g., a holiday)
- Listen to music or radio programs that you like while you exercise
- Reflect on why you find exercise boring. At a nuts and bolts level, exercise is really just moving your body. If you understand what you find boring, with some creativity you might be able to come up with an exercise routine that you like.

TBARRIER\_COST [Edit](#) [View](#)

Edited on 27/6/18created on 30/4/18

### When money is tight

We understand that most people are on a tight budget, but the good thing is that exercising does not have to be expensive

- Once you've got some walking shoes, walking is free and one of the best types of exercises you can do.
- Look at the library page of this website for the fact sheets which show **exercises around the home for free**.
- Walking is one of the best ways to stay active and it's free (well, once you have shoes)!

- Gym memberships are expensive – what can people do if this is where they want to exercise?
- Try shopping around, you might be surprised is around- perhaps it might just be one class a week for usually less than \$10
- Try a home-based or community program: see if your local council or community groups may offer free or cheap classes, or even a community garden

Equipment doesn't have to be expensive

- **Borrow** what you can
- You can replace weights with water bottles or cans of vegetables
- Note that free stuff doesn't have to be less fun/ or less effective.
- Find exercise equipment in your local parks
- Often parks have free easy to use equipment that you might be able to give a go
- Exercise from home
- Watching TV? Walk around the house during the ad break or do strength training while you watch
- Do some strength exercises at home: check out the video library
- Cleaning burns calories too!
- Do the dishes, or clean out a cupboard or vacuum/mop the floor: every bit helps
- Did you dance when you were younger?
- Put your favourite music on that makes you want to move,
- No one can see you so just do what you want to

TBARRIER\_ISOLATED [EditView](#)

Edited on 27/6/18 created on 30/4/18

No one to exercise with?

Having no one to exercise with can be challenging, especially when doing activity on your own is hard enough.

Here are some tips we thought of, but you might think of your own

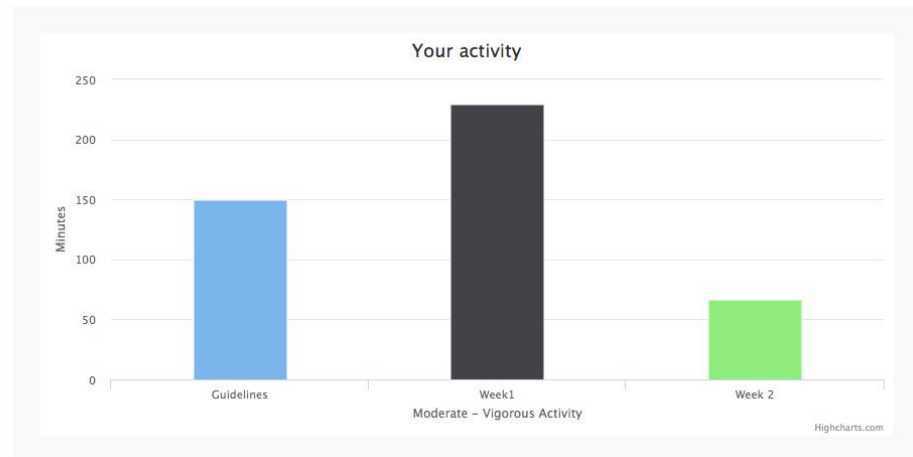
- Odds are there are others in the same position as you
- The Men's Shed movement is one which links men together where you can work on projects. [Find one near you](#)
- If you're not part of a community group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say
- [Find a group](#)
- [What are the prostate cancer foundation support groups?](#)
- Call up your council: often there are free or discounted community exercise
- Did you know that there are free walking groups with the Heart Foundation?  
[Find a FREE group](#)
- [Heart Foundation Site](#)
- Like technology?
- Have a look at this summary page of different virtual apps that could help <https://www.wikihow.com/Find-a-Virtual-Workout-Partner>

Moderate - Vigorous Activity  
Minutes Your activity  
Week 1 Week  
2050100150200250300350  
Highcharts.com

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last week and this week.



TRESS\_SESS\_2 [Edit](#) [View](#)

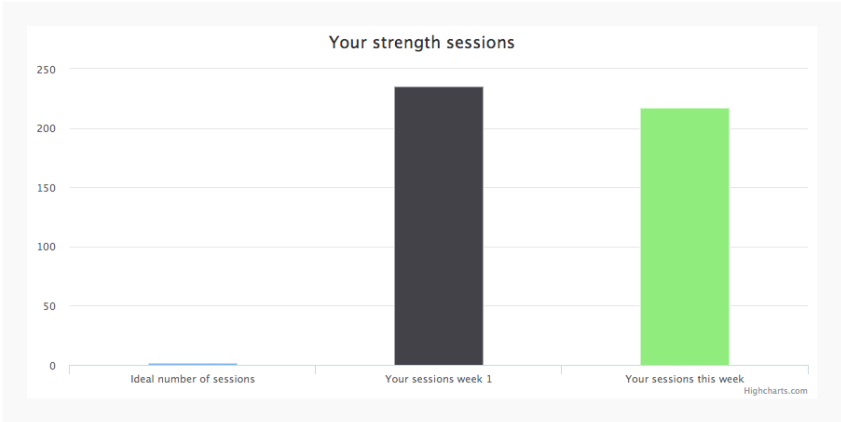
Edited on 21/6/18 created on 3/5/18

Lets have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

Your strength sessions  
Ideal number of sessions  
Your sessions week 1  
Your sessions this week  
050100150200250  
Highcharts.com

Lets have a look at your strength (resistance) training levels-  
Pick a goal for next week and we'll ask you about it



TRESS\_EX\_2 [Edit](#) [View](#)

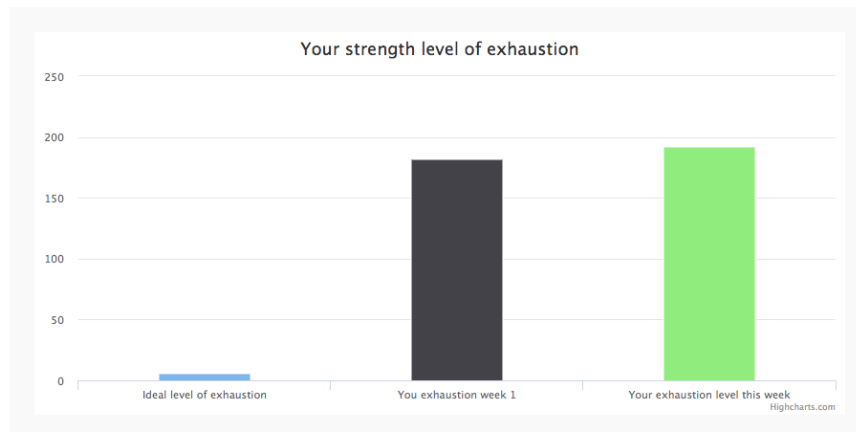
Edited on 8/5/18created on 3/5/18

Your strength number of exercisesIdeal number of exercisesYou number of exercises  
week 1Your number of exercises this week050100150200250300Highcharts.com



TRESS\_EXHAUST\_2 [Edit](#) [View](#)

Edited on 19/6/18created on 3/5/18



Your strength level of exhaustion  
Ideal level of exhaustion  
You exhaustion week 1  
Your exhaustion level this week  
050100150200250  
Highcharts.com

TGOAL1\_MORE [Edit](#) [View](#)

Edited on 28/5/18 created on 7/5/18

Let's look at your goals and activity for this week

Well done meeting your goal! You're doing really well, keep going and adjust that goal up to increase you're activity to meet your goal for the next week

TGOAL1\_SAME [Edit](#) [View](#)

Edited on 8/5/18 created on 7/5/18

Let's look at your goals and activity for this week

Well done on your goal for the first week! You're doing really well, keep going in the direction that you feel that your going in- if its working for you, keep doing it for your goal next week

TGOAL1\_SOSO [Edit](#) [View](#)

Edited on 28/5/18 created on 7/5/18

Let's look at your goals and activity for this week

Looks like things were a bit tricky for you this week meeting your goal. Have a think about adjusting your goal:

Is it achievable for you at the moment?

We suggest adjusting your goal, start smaller and build up to bigger goals over time

T\_GOALS [Edit](#) [View](#)

Edited on 27/6/18 created on 7/5/18

Why are goals important?

**Research has shown consistently shown that people are better at making changes if they have goals to aim for.**

While this program is asking you about minutes of activity, or strength training sessions- think about what you ACTUALLY want: Practical goals

Practical goals could include;

- to lose weight,
- to find activity or exercise that I enjoy
- to stay in my own home longer,
- to stop falling over and avoid going to the hospital,
- to help my wife with the shopping,
- to pick up my grandkids,
- to go travelling
- or to prune that fruit tree I've been meaning to get to...

Whatever your goal is, **write it and keep it somewhere where you can look at it regularly-**

- This will help remind you what you're aiming for when things get a bit hard
- **Turning goals into habits:** Aim to make a goal to exercise at the **same time and same place**
- For example "No matter what I aim to walk for 15 mins on Mondays, Wednesdays and Fridays from 8 to 8.15am"

Wanna find out more? Read the articles about behaviour change in our library

TGOAL1\_NOGOAL [Edit](#) [View](#)

Edited on 21/6/18created on 7/5/18

You said you didn't set a goal for your activity last week: we strongly recommend you give it a go.

Why? Goals give something to aim for, and gives a good feeling when we reach it. The research shows that those who make goals tend to have better outcomes. Keep clicking to find out more about goal setting

TGOAL1\_HARD [Edit](#) [View](#)

Edited on 21/6/18created on 8/5/18

*Adjust your goal*

Looks like things were a bit tricky for you this week

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 8/5/18created on 8/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

See you next week: good luck meeting your goal

TDAYS\_FEW [Edit](#) [View](#)

Edited on 19/6/18created on 8/5/18

You said you were active on {DAYS\_ACTIVE\_2} day(s) in the last week, that's great. Keep going at your own pace

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 19/6/18created on 8/5/18



You said you were active {DAYS\_ACTIVE\_2} days in the last week! That's great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)

Edited on 19/6/18 created on 8/5/18

You said you were active {DAYS\_ACTIVE\_2} days in the last week! That's great, keep up the good work and keep going at your own pace into the next week of the program

TDAYS\_NONE [Edit](#) [View](#)

Edited on 21/6/18 created on 19/6/18

Looks like this week was a little difficult for you in terms of activity, but that's ok- don't beat yourself up.

Have a think about *why* things were hard for you, and brainstorm some ways you think you might be able to get around some of the problems

What do you think is manageable for you? Can you be active on one or more days in the next week of the program?

TGOAL\_SETTINGTIPS [EditView](#)

Edited on 27/6/18 created on 27/6/18

## TIPS FOR GOAL SETTING

**Basic goal setting:** Think about what you want and small changes that might lead to it. Big goals, and little goals.

For example:

Big goal

I want to walk to my shop which is a 15min walk away to help my wife.

The little goal this week:

Walk to the letterbox 3 times this week to build up my walking stamina

**Advanced goal setting:**

**THINK "SMART": SPECIFIC, MEASURABLE, ATTAINABLE, RELEVANT AND TIME-BOUND**

Be SPECIFIC about what you want to achieve

Find a way to MEASURE the progress

Make sure your goal is ATTAINABLE

Think about the RELEVANCE of your goal to your life

Make sure your goal is TIME-BOUND

Find out more by visiting ["How to write a smart goal"](#)

Print out our [SMART Goals template](#) to fill out

TBARRIER\_OTHER [Edit](#) [View](#)

Edited on 27/6/18 created on 27/6/18

Facing barriers to being more active

In the list we provided, you said that the main barrier you face was not listed and we asked you to provide feedback on what we missed.

However, we do know that identifying the barriers you face and brainstorming ways to overcome them can really help.

Whatever it is, have a think about why you consider it your main barrier and think about possible solutions that best suit you in your life

If you have trouble thinking of ways to overcome the barrier that is stopping you -> contact our expert clinical exercise physiologist Holly in the "Ask an Expert" section of PCHF

Module 3: Lone ranger or socialite? Exercising with others (Social Support) + Physical activity log 3

*Module 3: Lone ranger or socialite? Exercising with others*  
*(Social Support) + Physical activity log 3*

Goal 2

#1

Did you meet your goal in last week?

Last week we asked you to set a goal- how did you go?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

PA MVPA intro

#2

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

### MOD MINS 3

#3

#### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

### VIG MINS 3

#4

#### Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skippping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

## Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES\_SESS\_3

#5

**Jumps** to 8

RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of training in which you are working against some type of force that resists your body movements. Resistance bands Weights Your own body They are designed to build up muscle, strength, endurance and power.	Repeated shovelling in the garden Specific exercises, for example Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges Step-ups Calf raises Core bracing Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES\_EXEC\_3

#6

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

RESS EXHAUST 3

#7

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

DAYS ACTIVE 3

#8

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

SOCIALSUPPORTPREF

#9

Lone ranger or socialite?

Which sentence do you think is the most relatable to you when it comes to exercise?

- ☐ I like to exercise alone. I'm pretty good at sticking to things when I set them.
- ☐ I like to exercise mostly alone, but sometimes it helps with someone else asks if they come with me can be good
- ☐ I tend to like to do things by myself but to be honest, I'm not great at sticking with it
- ☐ I like a mix, sometimes alone and sometimes with others. Depends on how I'm feeling or the activity I'm doing
- ☐ I like being with a friend, partner or group when I do activity

Socialsupport\_satis

#10

**Jumps** to end

Are you happy with your current level of support you get from your partner/  
community/ friends/ family or professionals?

- ☐ Not really
- ☐ Yeah its ok

Module 3: Lone ranger or socialite? Exercising with others (Social Support) + Physical activity log 3 Algorithms

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*Module 3: Lone ranger or socialite? Exercising with others*  
*(Social Support) + Physical activity log 3 Feedback*

TSOCIAL\_INTRO [Edit](#) [View](#)

Edited on 31/7/18 created on 6/7/18

Welcome to week 3 of Prostate Cancer Health and Fitness Online

Hi {user\_firstname}

This one is a short week in terms of information

If you want to do more this week, please check out some of the articles in the library

How have you been finding the videos or the exercise instruction sheets? Have you had a look at them?

This weeks' focus:

Exercising alone or with others

Bottom of Form

TMVPA\_3\_GRAPH [Edit](#) [View](#)

Edited on 31/7/18 created on 7/5/18

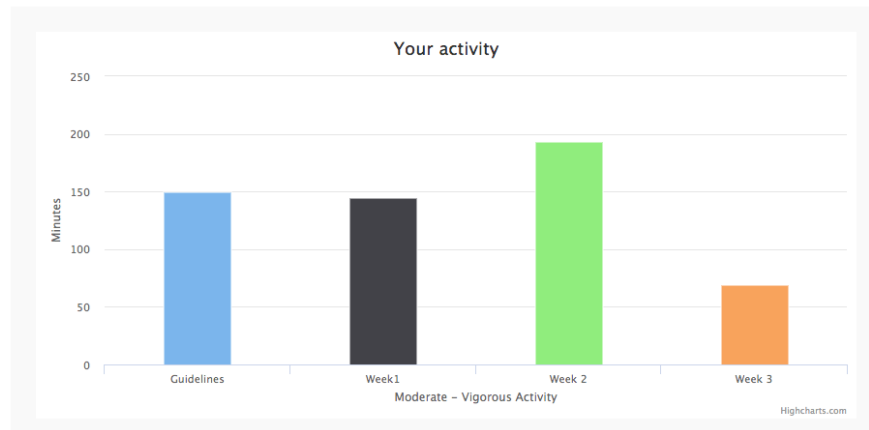
Let's look at your level of activity

We will compare your levels from last two weeks and this week.

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last two weeks and this week



Moderate - Vigorous ActivityMinutesYour activityWeek1Week 2Week

30100200300400Highcharts.comWeek 3● Series 1: 299

TRESS\_SESS\_3 [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

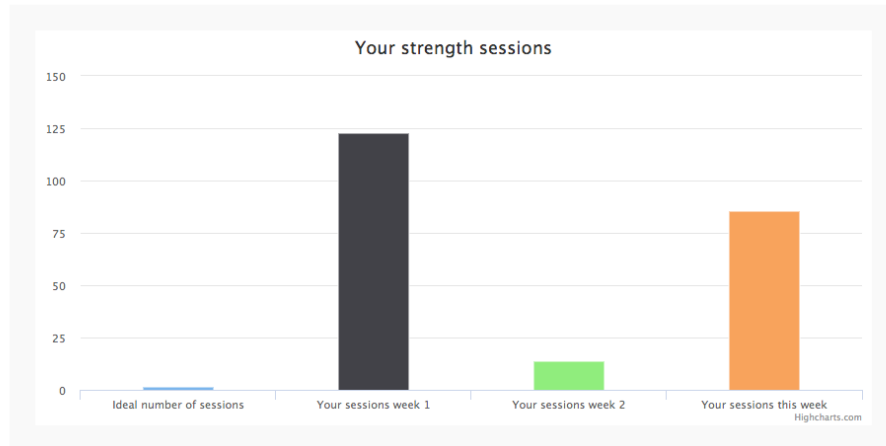
Let's have a look at your strength (resistance) training levels-

Pick a goal for next week and we'll ask you about it

Strength Training Week 1Ideal number of sessionsYour sessions week 1Your sessions

week 2Your sessions this week050100150200250300Highcharts.com

Lets have a look at your strength (resistance) training levels-  
Pick a goal for next week and we'll ask you about it



TRESS\_EX\_3 [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

Strength Training Week 1Ideal number of exercisesYou number of exercises week  
1Your number of exercises week 2Your number of exercises week  
3050100150200250300Highcharts.com



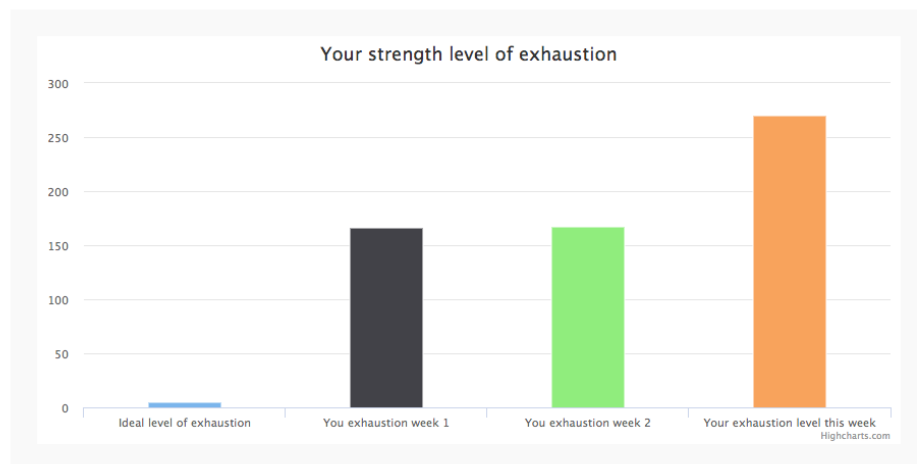
TRESS\_EXHAUST\_3 [Edit](#) [View](#)

Edited on 19/6/18created on 7/5/18

Strength Training Week 1  
 Ideal level of exhaustion  
 You exhaustion week 1  
 Your exhaustion week 2  
 Your exhaustion this week  
 050100150200250300  
 Highcharts.com

TRESS\_EXHAUST\_3 [Edit](#) [View](#)

Edited 50 minutes ago  
 created 54 minutes ago



Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

TDAYS\_FEW [Edit](#) [View](#)

Edited on 19/6/18 created on 8/5/18

Well done! You said you were active on {DAYS\_ACTIVE\_3} day(s) in the last week

TDAYS\_LOTS [Edit](#) [View](#)

Edited on 19/6/18 created on 8/5/18

Well done, you said you were active {DAYS\_ACTIVE\_3} days in the last week! That's great, keep up the good work

TDAYS\_SOME [Edit](#) [View](#)

Edited on 19/6/18 created on 8/5/18

You said you were active {DAYS\_ACTIVE\_3} days in the last week! That's great, keep up the good work, and keep going at your own pace

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 8/5/18created on 8/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

See you next week: good luck meeting your goal

TGOAL2\_MORE [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Let's look at your goals and activity for this week

Well done meeting your goal! You're doing really well, keep going and adjust that goal up to increase you're activity to meet your goal for the next week

TGOAL2\_SAME [Edit](#) [View](#)

Edited on 28/5/18created on 10/5/18

Let's look at your goals and activity for this week

Well done on your goal for the previous week! You're doing really well, keep going in the direction that you feel that your going in- if its working for you, keep doing it for your goal next week

TGOAL2\_SOSO [Edit](#) [View](#)

Edited on 28/5/18created on 10/5/18

Let's look at your goals and activity for this week

Looks like things were a bit tricky for you this week meeting your goal. Have a think about adjusting your goal:

Is it achieve able for you at the moment?

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TGOAL2\_NOGOAL [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

You said you didn't set a goal for your activity last week: we strongly recommend you give it a go.

Why? Goals give something to aim for, and gives a good feeling when we reach it. The research shows that those who make goals tend to have better outcomes. Keep clicking to find out more about goal setting

TGOAL2\_HARD [Edit](#) [View](#)

Edited on 10/5/18created on 10/5/18

Tough week?

Looks like things were a bit tricky for you this week

We suggest adjusting your goal, start smaller and build up to bigger goals over time

TDAYS\_NONE [Edit](#) [View](#)

Edited on 19/6/18created on 19/6/18

While you've not been heaps active over the last week, that's ok- have a think about what happened this week and why you weren't able to get moving

Think about what might work for you, set a goal for next week and we will ask you about it

TSOCIAL\_1 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Doing stuff by yourself is great. It means you're self-motivated and that's brilliant.

Keep doing what you're doing as its working for you.

If things change down the track....

- If something changes, have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional

- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Have a think about what might work for you
- Additionally, what might be going on in your community? Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_2 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Its great that you are able to get on with things alone for the most part- it means your self-motivated and this is fantastic.

Keep doing what you're doing as its working for you.

If things change down the track....

- If something changes, have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?



- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
  - Have a think about what might work for you
  - Other tips and tricks
- 
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
  - Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
  - The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
  - [Find a group for prostate cancer](#)
  - [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_3 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Being able to exercise alone and with others is a good balance, but we know its hard when there aren't other people to help to keep you accountable.

However, if you're happy with how you're tracking, that's good. Keep doing what you're doing.

- Here are some tips we thought of, but you might think of your own
- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.
- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional

- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_4 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Mixing alone activity with social activity is great! Keep it up

If you're happy with how you're tracking, that's good. Keep doing what you're doing.

Here are some general tips we thought of - but you might think of your own

Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.

Have a think about what you might like to do in terms of building up your support network.

It might be a partner, a friend, a family member, or a professional

Did you know that those with good social networks tend to stick with their exercise goals longer?

- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_5 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Exercising with others can often work well when you're getting more active

Exercising with others often means that you'll stick with the activities you've set out to do: at least according to theory.

Overall, the research shows that those with good social networks tend to stick with their exercise goals longer?

If you're happy with how you're tracking, that's good. Keep doing what you're doing.

If things change or you'd like to do more activity on your own (for example if someone cancels on you) we have thought of some ideas - but you'll think of your own and what suits you

Have a brainstorm about things you might like do to on your own that you would be able to integrate into your life.

If you like videos, have a look at our library for instructions on activities to do on your own.

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you.
- If you like to be around others, we had a few other ideas: Though you might already have known about these or already do things.
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- It might not work for some people, but sometimes it can be great to find something new.
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- If you're not part of a community group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say
- [Find a group](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_6 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Doing stuff by yourself is great. It means you're self-motivated and that's brilliant.

However, you said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?

What might you like to do in terms of building up your support network?

It might be a partner, a friend, a family member, or a professional

Here are some tips that might work for you, but you might come up with your own

- Have a think about what you might like to do in terms of building up your support network.
- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_7 [Edit](#) [View](#)

Edited on 6/7/18created on 6/7/18

Its great that you are able to get on with things alone for the most part- it means your self-motivated and this is fantastic.

However, you said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would it do to your ability to be more active?

Here are some tips that might work for you, but you might come up with your own. Have a think about what you might like to do in terms of building up your support network.

- It might be a partner, a friend, a family member, or a professional
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

Edited on 6/7/18 created on 6/7/18

Being able to exercise alone and with others is a good balance, but we know its hard when there aren't other people to help to keep you accountable.

You said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you
- What you might like to do in terms of building up your support network?
- It might be a partner, a friend, a family member, or a professional
- Here are some tips that might work for you, but you might come up with your own.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.

- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)

[What are the prostate cancer foundation support groups?](#)

TSOCIAL\_9 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Mixing alone activity with social activity is great! Keep it up

You said that you're not really happy with the level of support that you're receiving.

We suggest having a think about why you're not really feeling happy with the level of support. If the level of support did change what would you like it to do to your ability to be more active?

- Think about ways in which you can balance self-motivation and self-accountability (like trying to work towards goals and finding enjoyable activities) and use the network of people around you
- What might you like to do in terms of building up your support network?
- It might be a partner, a friend, a family member, or a professional

Here are some tips that might work for you, but you might come up with your own.

- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment.
- Did you know that those with good social networks tend to stick with their exercise goals longer?
- It could be to have someone to complain to when you don't feel like heading out on that walk, or someone to cheer you on when the going gets tough- or someone to ask for practical help like asking to borrow old exercise equipment
- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?



- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement is one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)

TSOCIAL\_10 [Edit](#) [View](#)

Edited on 6/7/18 created on 6/7/18

Exercising with others can often work well when you're getting more active

However, you said that you're not really happy with the level of support that you're receiving.

The benefits of exercising with others

Exercising with others often means that you'll stick with the activities you've set out to do: at least according to theory.

Overall, the research shows that those with good social networks tend to stick with their exercise goals longer

The need to be self-motivated too

- Have a brainstorm about things you might like to do on your own that you would be able to integrate into your life.
- If someone cancels on you and you're on your own, you'll need to think of ways to stay active.
- If you like videos, have a look at our library for instructions on activities to do on your own.
- If you like to be around others and want to increase your levels of community: we had a few other ideas: Though you might already have known about these or already do things.

- Have a think about what might be going on in your community. Does your local offer anything like a community garden, or an exercise programs at all?
- Sometimes there are free walking groups with the Heart Foundation? It could work but it does depend on your location. Check out the [Heart Foundation Site](#) to see if there is anything around your area.
- The Men's Shed movement in one which links men together and men often work on activities in and around a shed. [Find one near you](#)
- [Find a group for prostate cancer](#)
- [What are the prostate cancer foundation support groups?](#)
- If you're not part of a community group or the online group for prostate cancer, you might be surprised what information other prostate cancer survivors have to say

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 8/5/18created on 7/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

See you next week: good luck meeting your goal

*Module 4: Making long term changes (habit formation) + Physical activity*  
*Log 4*

Bottom of Form

Intro\_module4

#1

Welcome to the final week of the program.

We're going to chat about habit formation and finding resources for you to use

Please fill in the questions below

Goal\_3

#2

Last week we asked you to set a goal.

Did you meet your goal in last week?

- ☐ Yes, I'm happy with the progress I'm making and I'd like to do more next week
- ☐ Yes, I'm happy with the progress I'm making and I'd like to stay the same for now
- ☐ Sort of- its not been as easy as I had hoped but I'm doing ok
- ☐ Not really, its been harder than I thought to meet my goals
- ☐ I didn't set a goal

PA\_MVPA\_intro

#3

Physical Activity

We are looking at 2 types of activity you may have done this week.

- 1) Aerobic or cardio based activity
- 2) Resistance or strength training

Let's look at your aerobic or cardio activity first.

AEROBIC ACTIVITY

Have a look at the scale below and think about any activities that might fall into the 3-10 range on the scale.

The orange category we would rate as moderate levels of activity and the red could be considered vigorous levels of activity

#### MOD MINS 4

#4

##### Moderate activity

For example

Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time

Dancing, playing games with children

Gardening, light digging, planting, weeding

Walking the dog, or other animals

Household tasks, washing windows, mopping floors

Lawn mowing with a powered lawn mower

Gentle swimming

In the last week, how many **minutes** of moderate activity do you think you did?

#### VIG MINS 4

#5

##### Vigorous Activity

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching

Fast walking

Moderate-swimming

Skiping

Going up hills/ hiking

Basketball

Quick cycling

Aerobics

Jogging

In the last week: how many minutes of vigorous activity do you think you did?

RES\_SESS 4

#6

**Jumps** to 9

RESISTANCE TRAINING:

What is resistance training?	Examples
Resistance exercise, also known as strength training, is a form of training in which you are working against some type of force that resists your body movements. Resistance bands Weights Your own body They are designed to build up muscle, strength, endurance and power.	Repeated shovelling in the garden Specific exercises, for example Partial or full squats Sit to stand practice Wall, bench or full push-ups Core exercises Lunges Step-ups Calf raises Core bracing Elastic/ theraband exercises

In the last week, did you do any sessions of resistance training?

**If you did NOT do any sessions (0 sessions) please skip the other resistance training questions**

RES\_EXEC 4

#7

In the last week, how many different types of exercises did you do on average in each session?

For example

I did 5 wall pushes and then I did 12 arm raises on each arm= 2 different types of resistance exercises

#### RESS\_EXHAUST\_4

#8

Perception of how exhausting an activity felt is a very individual experience and depends on your own fitness levels

Take a look at the graph of exhaustion levels

In the last week, in your sessions: how exhausted do you think you felt on a scale of 1 - 10?

#### DAYS\_ACTIVE\_4

#9

In the last week, how many days do you think you did any of the above (aerobic and or resistance) activities?

For example,

I went for a walk with my daughter on Saturday = 1 day of activity this week

I went and helped at the museum and we painted a wall on Sunday = 1 day

I did a gym session and I used the weight machines once this week = 1 day

I played 1 game of golf on Saturday and I went for a walk with my dog on Thursday = 2 days

I walked around the block twice a week, and I did gardening on Friday = 3 days

I weeded around the community centre, and then had 4 half an hour walks = 5 days

Sessions

#### Automatic Likert

#10

Select a response which best fits for you.

Deciding to engage in physical activity is something I do...

Strongly Disagree (1)

Strongly Agree (7)

Auto\_1

#11

Automatically

**Strongly disagree**Strongly agree

Auto\_2

#12

Without thinking

**Strongly disagree**Strongly agree

Auto\_3

#13

Without having to consciously remember

**Strongly disagree**Strongly agree

Auto\_4

#14

**Jumps** to end

Without realising I'm doing it

**Strongly disagree**Strongly agree

*Module 4: Making long term changes (habit formation) + Physical activity*  
*log 4 Algorithms*

```
$fbbackGroups = ['TUNNEL', 'FINISHEDCONTROL_TUNN'];
show('TLT_INTRO', $fbbackGroups);
$habitstrength = ($Auto_1 + $Auto_2 + $Auto_3 + $Auto_4);
//create a variable ranging from 0-24 (by ensuring response option ranges from 0-6
rather than 1-7)
if ($Goal_3 == 1 && $habitstrength <= 12) show ('TMessage_1', $fbbackGroups);
if ($Goal_3 == 2 && $habitstrength <= 12) show ('TMessage_2', $fbbackGroups);
if ($Goal_3 == 3 && $habitstrength <= 12) show ('TMessage_3', $fbbackGroups);
if ($Goal_3 == 4 && $habitstrength <= 12) show ('TMessage_4', $fbbackGroups);
if ($Goal_3 == 5 && $habitstrength <= 12) show ('TMessage_5', $fbbackGroups);
//goal = 5 is no goal at all and low habit strength
if ($Goal_3 == 1 && $habitstrength > 12) show ('TMessage_6', $fbbackGroups);
if ($Goal_3 == 2 && $habitstrength > 12) show ('TMessage_7', $fbbackGroups);
if ($Goal_3 == 3 && $habitstrength > 12) show ('TMessage_8', $fbbackGroups);
if ($Goal_3 == 4 && $habitstrength > 12) show ('TMessage_9', $fbbackGroups);
if ($Goal_3 == 5 && $habitstrength > 12) show ('TMessage_10', $fbbackGroups);

// goal = 5 is no goal at all and high habit strength
// message 5 and 10 no goal
if ($DAYS_ACTIVE_4 == 0) show ('TDAYS_NONE', $fbbackGroups);
if ($DAYS_ACTIVE_4 >= 1 && $DAYS_ACTIVE_4 < 2 ) show ('TDAYS_FEW',
$fbbackGroups);
if ($DAYS_ACTIVE_4 >= 3 && $DAYS_ACTIVE_4 < 5 ) show ('TDAYS_SOME',
$fbbackGroups);
if ($DAYS_ACTIVE_4 >= 5) show ('TDAYS_LOTS', $fbbackGroups);
show('TMVPA_4_GRAPH', $fbbackGroups);
show('TRESS_SESS_4', $fbbackGroups);
show('TRESS_EX_4', $fbbackGroups);
show('TRESS_EXHAUST_4', $fbbackGroups);
```



```
show('TREARCH_LINKS', $fbbackGroups);  
show('TLT_CONCLUSION', $fbbackGroups);
```

*Module 4: Making long term changes (habit formation) + Physical activity*  
*log 4 Feedback*

TLT\_INTRO [Edit](#) [View](#)

Edited on 31/7/18 created on 30/4/18

Welcome to week 4 of Prostate Cancer Health and Fitness Online

Hi {user\_firstname}

Welcome to week 4, this is the last week of the program so let's make it count.

Remember to come back to this website in one week's time for the final research survey.

**This module is about making long term changes**

Long-term behaviour is often talked about in terms of habits. Habits are formed by repetition. In particular, when we repeat the same activity in response to the same prompt or cue over and over again.

It's not a quick fix- and while we like instant results, research shows that it can take 1-2 months to form new habits.

Think of physical activity becoming a normal part of your life, as opposed to the exception

If you didn't quite meet your goals, or you get an injury, don't beat yourself up about it

If you haven't already, ask someone to help to keep you accountable

If you go backwards for a bit, that's fine, it's all about steady engagement with physical activity

Change is slow, so it's important to write down, or monitor in some form what you're doing- that way you can look back in a couple of weeks and see how you're doing.

Sometimes you'll see obvious improvements, while others aren't so obvious. The main thing is to keep doing as much as you can

TLT\_CONCLUSION [Edit](#) [View](#)

Edited on 21/6/18 created on 30/4/18

Thank you for completing the last module.

This is your last week: MAKE IT COUNT

As part of the research, please complete the follow-up *research* survey in **7 days time**

This will have similar questions to the one you filled out at the beginning

This will ask you about how you found the website and give you a chance to give feedback to our team

You will receive a reminder email to complete the final research survey

TREARCH\_LINKS [Edit](#) [View](#)

Edited on 7/5/18created on 7/5/18

WANT TO LEARN MORE?

Check out the library tab at the top of the website for the research articles, examples of strength training and more general information

TMVPA\_4\_GRAPH [Edit](#) [View](#)

Edited on 31/7/18created on 8/5/18

Cardio minutes of activity

Let's look at your level of activity - We will compare your levels from last three weeks and this week.

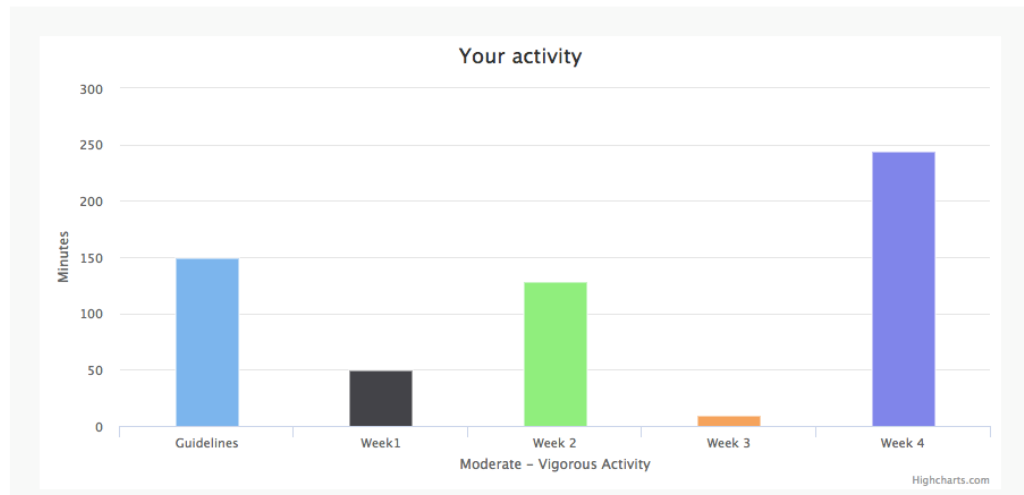
Moderate - Vigorous ActivityMinutesYour activityWeek1Week 2Week 3Week

4050100150200250300Highcharts.comWeek 4● Series 1: 193

## Cardio minutes of activity

Lets look at your level of activity as we start this program.

We will compare your levels from last three weeks and this week



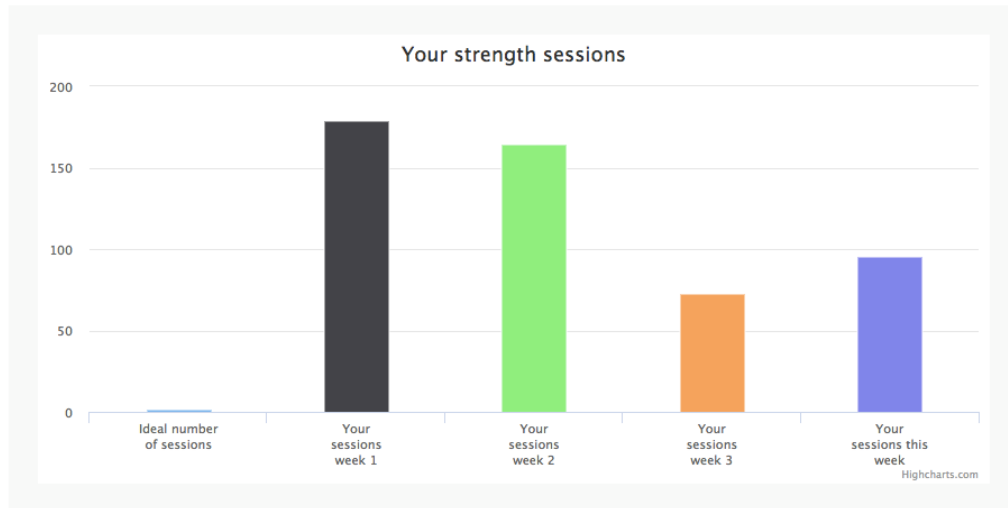
TRESS\_SESS\_4 [Edit](#) [View](#)

Edited on 10/5/18 created on 10/5/18

Lets have a look at your strength (resistance) training levels -

Your strength sessions  
Ideal number of sessions  
Your sessions week 1  
Your sessions week 2  
Your sessions week 3  
Your sessions this week  
050100150200250300  
Highcharts.com

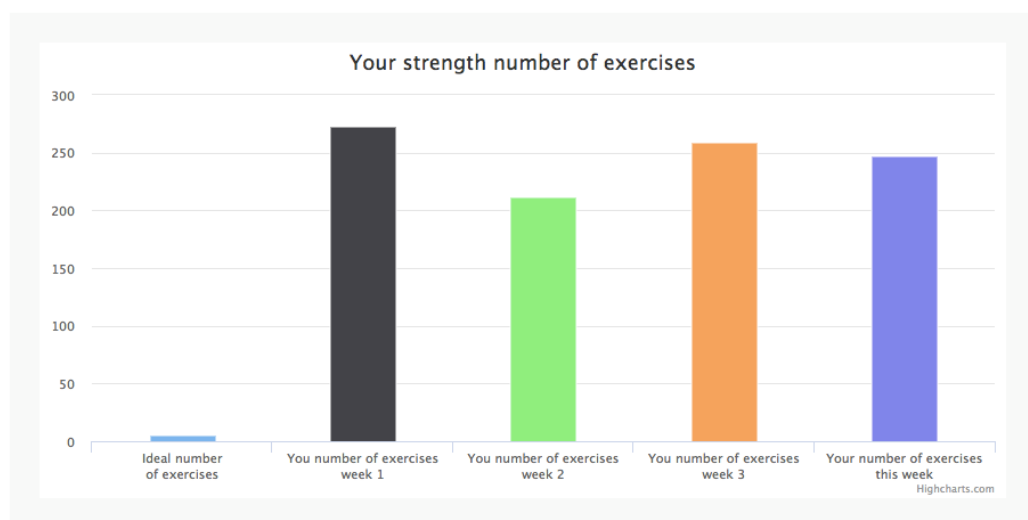
Lets have a look at your strength (resistance) training levels -



TRESS\_EX\_4 [Edit](#) [View](#)

Edited on 10/5/18 created on 10/5/18

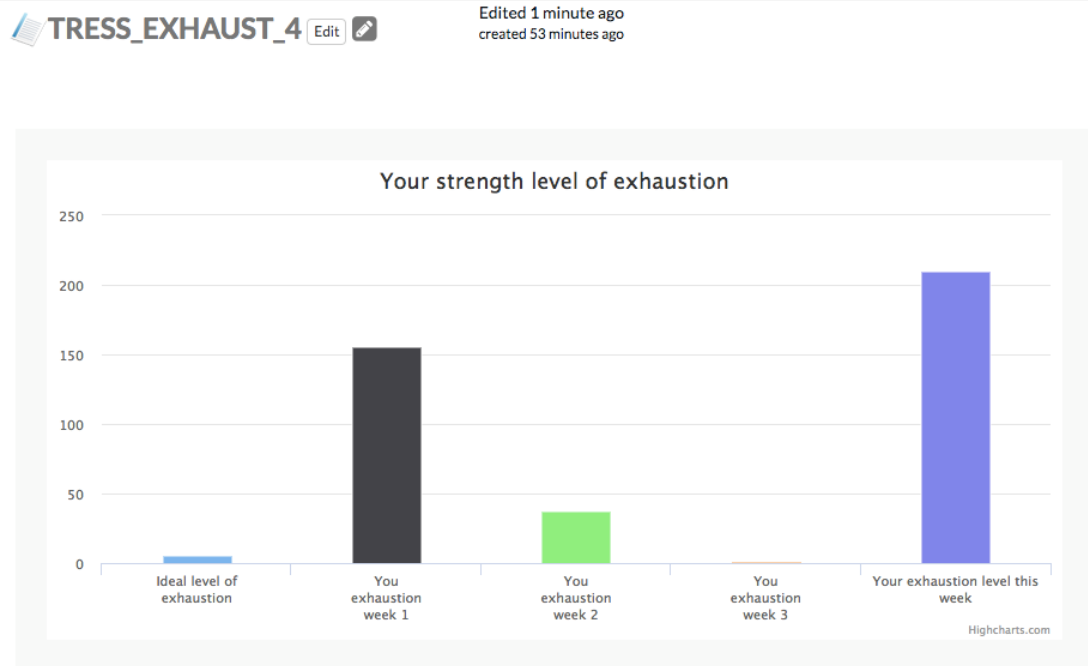
Your strength number of exercises  
Ideal number of exercises  
You number of exercises  
week 1  
You number of exercises  
week 2  
You number of exercises  
week 3  
Your number of exercises  
this week  
050100150200250300  
Highcharts.com



TRESS\_EXHAUST\_4 [Edit](#) [View](#)

Edited on 19/6/18created on 10/5/18

Your strength level of exhaustionIdeal level of exhaustionYou exhaustion week 1You  
exhaustion week 2You exhaustion week 3Your exhaustion level  
thisweek0255075100125Highcharts.com



TDAYS\_NONE [Edit](#) [View](#)

Edited on 19/6/18created on 19/6/18

While you've not been heaps active over the last week, that's ok- have a think about what happened this week and why you weren't able to get moving  
Think about what might work for you, set a goal for next week and we will ask you about it

TMessage\_1 [Edit](#) [View](#)

Edited on 13/7/18created on 9/7/18

Wow, you're on a roll!

You said that you're not only happy with the goals you're setting but you also want to do more next week.

You also said that sometimes activity is not really an automatic part of your day and you might have to make a bit of an effort to make things happen.

- While things might not be on 'auto' pilot for you- you're making a real effort to build up your activity.
- It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you'll exercise.
- Some people get sick of this after a while so it is good to 'protect yourself' by making activity a bit more automatic.

Here is how you can do that:

- The idea is that we go from having to make a lot of effort and getting into an 'auto pilot' mode- to the point where you don't even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.
- It's the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.
- Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_2 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Great news- you're doing really well

You said you're happy with the goal that you have and you're going to stay the same for now.

Keep maintaining what you are already doing, but one thing to consider are the principles of habit formation.

Your scores suggested your physical activity behaviour is not very automatic at the moment- you have to make a real effort to plan to do it.

Some people get sick of this after a while so it is good to ‘protect yourself’ by making activity a bit more automatic.

Here is how you can do that:

- The idea is that we go from having to make a lot of effort and getting into an ‘auto pilot’ mode- to the point where you don’t even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.
- It’s the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.
- Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_3 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Thinking about habits

You said your goal was sort of tricky and you also scored fairly low-moderate on the automatic behaviour scale.

- This is ok, but one thing that might make meeting your goals easier is thinking about habit formation.
- It will take the same amount of effort that you are putting it now, but will result in you not having to stew over it later.
- It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you’ll exercise.
- Some people get sick of this after a while so it is good to ‘protect yourself’ by making activity a bit more automatic.



Here is how you can do that:

The idea is that we go from having to make a lot of effort and getting into an ‘auto pilot’ mode- to the point where you don’t even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.

It’s the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.

Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_4 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

How to make your goals easier to meet

One thing that might make meeting your goals easier is thinking about habit formation. You scored in the low-moderate range of the automatic behaviour scale meaning that you have to make a real effort to get that activity booked in to meet your goals

If you can work towards getting activity as a habit, will take the same amount of effort that you are putting it now, but will result in you not having to stew over it later.

It is fine not to get into a routine, but it just means that to maintain your routine you might need to keep setting goals and planning when you’ll exercise.

Some people get sick of this after a while so it is good to ‘protect yourself’ by making activity a bit more automatic

Here is how you can do that:

The idea is that we go from having to make a lot of effort and getting into an ‘auto pilot’ mode- to the point where you don’t even notice as its just become part of your daily routine- like cleaning your teeth before bed or having a meal.

It’s the same with being more active in general- its going from feeling like you have to make a lot of effort to be more active and getting to the point where you might always go for a walk straight after an event in your day, like after breakfast or before dinner.

Questions to ponder: What might work for you to be able to make the changes long term? Are there parts of your routine that you could work being more active?

TMessage\_5 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Goals and habits?

- If you are not that into setting goals, its fair enough as it's not for everyone.
- If you're doing a lot of activity, it is likely that you've found what works for you which is great
- If you're not doing a lot of activity for you (remember it's about being better than before) maybe think about *when* you exercise rather than how much you do...

### *Habits*

Getting it into a daily or weekly habit means you won't have to put as much effort into being more active- you'll barely notice it the same way that you might brush your teeth each night and think nothing of it.

This is based on what we know about habit formation.

If you can start by exercising at the same time, and attach it to another event – you won't have to plan as much

Have a think about what might work for you, and we highly encourage you to actually put a goal in place if you're not happy with the amount that you're achieving.

TMessage\_6 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Wow! You're on a roll!

You said you're wanting to increase your behaviour and that you do tend to do things in an automatic way. Sweet.

Here is why that is great news.

Those who are able to get things into ‘automatic’ gear mean that the changes you make now to increase your exercise and activity are more likely to stick. It means you might get to a point where you don’t even realise you’re being more active as it becomes a part of your life: the same way you might clean your teeth at night.

This gives you a much higher chance of success at making this changes that you’re committing too easier to maintain in the long run.

TMessage\_7 [Edit](#) [View](#)

Edited on 13/7/18created on 9/7/18

Keep up the good work!

You said you’re happy with the goals your setting at you want to maintain this level.

You also scored moderate-high on the automatic behaviour score

Here is why that is great news.

Those who are able to get things into ‘automatic’ gear mean that the changes you make now to increase your exercise and activity are more likely to stick. It means you might get to a point where you don’t even realise you’re being more active as it becomes a part of your life: the same way you might clean your teeth at night.

This gives you a much higher chance of success at making this changes that you’re committing too easier to maintain in the long run.

TMessage\_8 [Edit](#) [View](#)

Edited on 13/7/18created on 9/7/18

You're doing ok- keep going

You scored high on ‘automaticity’. This is really good.

It means that you’re able to think about integrating physical activity automatically into your life.

This makes it easier in general to be more activity over time.

Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.

You also said that were 'sort of' able to meet your activity goal. Have a think about what has made your goal harder to reach?

Is your goal too high? Have you got enough support? Did you schedule your activity in? Have a think about what happened this week to mean that you feel you're not happy with the goal.

TMessage\_9 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Hard week, but you're doing ok

- You said that your goal was hard to reach this week. What do you think has made your goal harder?
- But... You scored high on 'automaticity'. This is really good.
- It means that you're able to think about integrating physical activity automatically into your life.
- This makes it easier in general to be more activity over time.
- Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.

Have a think- Is your goal too high? Have you got enough support? Did you schedule your activity in?

TMessage\_10 [Edit](#) [View](#)

Edited on 13/7/18 created on 9/7/18

Going on autopilot

You scored moderate- high on 'automaticity'. This is really good.

- It means that you're able to think about integrating physical activity automatically into your life.
- This makes it easier in general to be more activity over time.

- Like the way we learn to clean our teeth and do it without really thinking about it, you're able to place physical activity into your life.
- How did you establish such a solid activity routine? Are you open to using the same approach to increase your activity?
- If you're able to continue these habits and we encourage you to work towards doing 150 minutes a week of aerobic activity and 2 sessions of strength training a week is considered the optimal amount for obtaining health benefits.
- If you're feeling that you're doing as much as you can without making goals, keep going and do what works for you

TAutonomy\_intro [Edit](#) [View](#)

Edited on 12/7/18 created on 12/7/18

Making long term changes

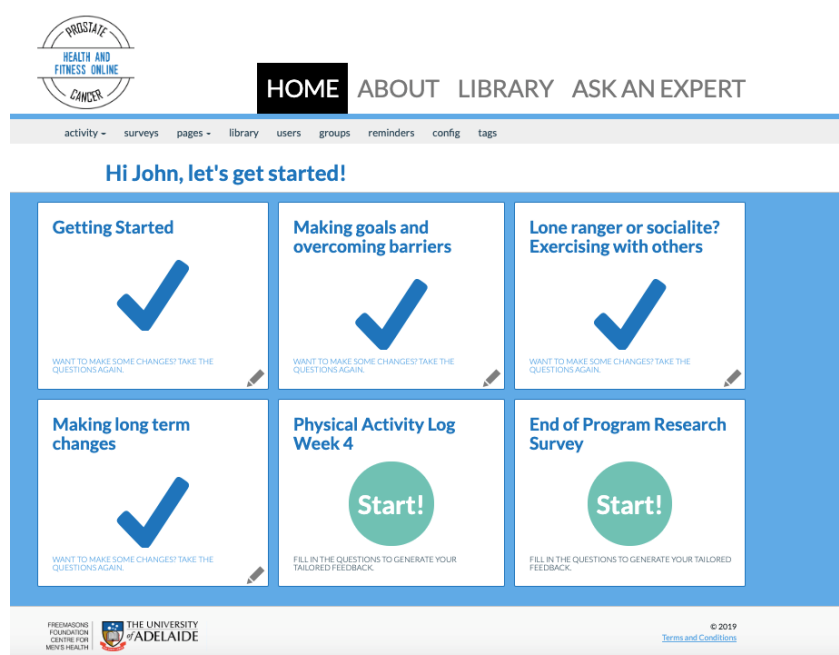
Long-term behaviour is often talked about in terms of habits.

Habits are formed by repetition. In particular, when we repeat the same activity in response to the same prompt or cue over and over again.

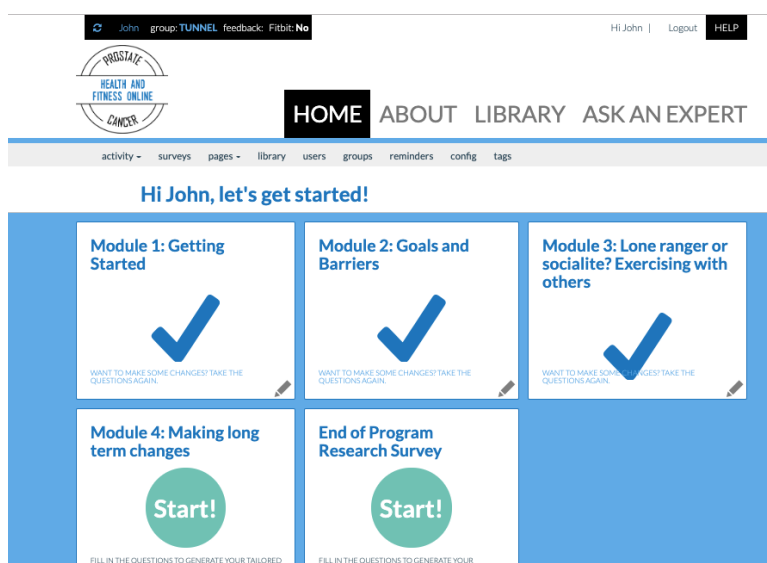
It's not a quick fix- and while we like instant results, research shows that it can take 1-2 months to form new habits.

# Appendix C: Prostate Cancer Health and Fitness Website Screen Shots


## Autonomy Supportive Home Page



## Standard Tunnel Home Page



## Control Group Home Page



[HOME](#) [ABOUT](#) [LIBRARY](#) [ASK AN EXPERT](#)


[activity](#) [surveys](#) [pages](#) [library](#) [users](#) [groups](#) [reminders](#) [config](#) [tags](#)

### Welcome to Prostate Cancer Health and Fitness Online


- The aim of this project is to see if a website can be an acceptable way to deliver information about physical activity
- Please complete the first research survey
- Take a look at the information below and in 4 weeks time we'll ask you to do the second research survey

[Edit this content](#)


#### Exercise Guidelines




WANT TO MAKE SOME CHANGES? TAKE THE QUESTIONS AGAIN.




#### What exercises can I do?




WANT TO MAKE SOME CHANGES? TAKE THE QUESTIONS AGAIN.




#### Links to more resources



WANT TO MAKE SOME CHANGES? TAKE THE QUESTIONS AGAIN.




#### End of Program Research Survey



FILL IN THE QUESTIONS TO GENERATE YOUR TAILORED

## About Us Page



John group: CGROUP feedback: Fitbit: No

activity - surveys pages - library users groups reminders config tags

# PROSTATE CANCER HEALTH AND FITNESS ONLINE

Our PCHF Project is designed to help build up your toolkit to increase your physical activity over time and provide some (hopefully) interesting resources for you to work through.

**Project Rationale:**

- Most men with prostate cancer aren't active enough to get the benefits of physical activity, and one way to do this is to use the internet to give some helpful tips
- The internet hasn't really been used before to deliver tailored messages to men who have had prostate cancer before - so we wanted to test this

**Project Aim:**

- The project aims to see if an Internet-delivered program can assist prostate cancer survivors to improve their physical activity
- The project randomised participants into a standard care group or an intervention group
- What aspects of the program are useful.

**Intervention Design**

- The program is evidence-based, including recommendations for physical activity programs from previous cancer programs, programs for older participants and uses clinical expertise
- A clinical expert evaluated and supported the message development
- Input from interviews and a survey of 16 men with prostate cancer who had undertaken a variety of treatment pathways were included in the development of this program.

## OUR TEAM

Amy Finlay



Amy has a background in men's health, psychology, health promotion, cancer and public health. She first worked for the Freemasons Foundation Centre for Men's Health as a scholarship student investigating men's participation in walking groups for the Renmark River Council and the University of South Australia. She has been a research assistant for the Discipline of General Practice, and the School of Rural Health in the Medical School in the University of Adelaide. She is passionate about men's health and wellbeing and this project forms the final study of her PhD.

Holly Evans



Holly Evans is an experienced exercise physiologist who is experienced in working with cancer patients prescribing exercise. She is currently completing her PhD under Dr Camille Short working with men with metastatic prostate cancer patients.



Dr Camille Short



Dr Camille Short is the primary supervisor of the team. Camille is a behavioural scientist and research fellow at the Freemasons Foundation Centre for Men's Health, School of Medicine, University of Adelaide. She completed her PhD in behavioural science at the University of Newcastle in 2013. Her work is cross-disciplinary, incorporating evidence and theory from health, social and cognitive psychology, computer science, marketing, exercise physiology, nutrition, oncology, and public health. She has attracted over 1 million AUD in research funding and currently holds a prestigious National Health and Medical Research Council Fellowship awarded by the Australian Government.

Professor Gary Wittert



Co-Supervisor

Professor Gary Wittert is the Head of the Discipline of Medicine, and Senior Consultant Endocrinologist at the New Royal Adelaide Hospital. He is Director of the Freemasons Foundation Centre for Men's Health Research, and a founding member of the Centre of Research Excellence in Nutritional Physiology. He heads the Centre for Nutrition and Gastrointestinal Diseases within the Nutrition Theme at the South Australian Institute for Health and Medical Research. He is also a lead researcher on the Australian National Health and Medical Research Council's Centre for Excellence, Centre for Prostate Cancer Survivorship (<http://prostatecancersurvivorship.org.au>)



RCT trial number: 12618000808246

## The Library Page

John group: FREE feedback: Fitbit: No

Hi John | Logout **HELP**

PROSTATE  
HEALTH AND  
FITNESS ONLINE  
CANCER

HOME ABOUT **LIBRARY** ASK AN EXPERT


activity - surveys pages - **library** users groups reminders config tags

Tags

All items

Barrier

### Welcome to the Prostate Cancer Health and Fitness Library



Edit this content

[Articles and video lectures about exercise and prostate cancer](#)

[Overcoming barriers to exercise](#)

[Exercise instruction sheets](#)

[Exercise videos](#)

## Like a bit more reading?

Here are some articles that you can read about from the science, behaviour and cancer

### General articles (easier to read and digest)

- [Exercise as medicine](#)
- [Exercise prescription for cancer](#)
- [Exercise and better survival](#)
- [Physiotherapy before and after treatment](#)
- [Diet and exercise](#)

### Pod-cast (audio interview)

- [Combating side effects with exercise](#)
- [Dr Sean talks about Lower Urinary Track Systems \(LUTS\)](#)

### Let's be Frank:

[Videos for Farmers health](#)

### Prostate Cancer Videos

[Prostate cancer: sex, relationships, and intimacy](#)

[Prostate cancer and mental health](#)

[Localised prostate cancer side effects](#)

[Exercise and prostate cancer: Dr Tran](#)

[Exercise and prostate cancer: Tim Hartwig](#)

[Exercise, prostate cancer in the UK](#)

### Science-based articles (high level of reading)

- [Barriers to exercise \(hormone treatment\)](#)
- [Barriers to exercise for breast and prostate cancer survivors](#)
- [Advancing prostate cancer in Australia](#)
- [At home exercise program for men with prostate cancer](#)
- [A systematic review of physical activity programs for men with prostate cancer](#)
- [A systematic review of cancer-related fatigue and exercise](#)
- [Measuring masculinity in the context of chronic disease](#)
- [Help seeking in first year of being diagnosed](#)
- [SHED IT: Aussie men's physical activity intervention](#)
- [Designing modern digital health interventions](#)
- [Let sleeping dogs lie](#)

Edit this content

[Back to library](#)

## Developed by ESSA (Exercise and Sports Science Australia)

**REAL MEN MOVE** made some great fact sheets about how to do certain exercises.

No point reinventing the wheel: our expert exercise physiologist has approved and said that these are appropriate for prostate cancer survivors

**YOU DON'T NEED FANCY EQUIPMENT FOR THESE:** Just stuff around your house


Stretching and Loosening the Body <ul style="list-style-type: none"><li>• <a href="#">Loosen up 1</a></li><li>• <a href="#">Loosen up 2</a></li><li>• <a href="#">Loosen up 3</a></li><li>• <a href="#">Stretch and strengthen</a></li><li>• <a href="#">Calf stretch</a></li><li>• <a href="#">Ankle stretch</a></li><li>• <a href="#">Neck stretch</a></li><li>• <a href="#">Shoulder stretch</a></li><li>• <a href="#">Shoulder roll</a></li><li>• <a href="#">Elbow/arm stretch (Rhomboid)</a></li></ul>	Exercises for strengthening and balance <ul style="list-style-type: none"><li>• <a href="#">Heel to toe walking</a></li><li>• <a href="#">Single leg stand</a></li><li>• <a href="#">Calf raises</a></li><li>• <a href="#">Plank</a></li><li>• <a href="#">Sit to standing</a></li><li>• <a href="#">Step-ups</a></li><li>• <a href="#">Wall push up</a></li><li>• <a href="#">Bench push up</a></li><li>• <a href="#">Kick back</a></li><li>• <a href="#">Shoulder press</a></li></ul>
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[Edit this content](#)

### *Example Links Provided in the Library section*

- <https://www.youtube.com/watch?v=cA1uF58IFDY>
- <https://soundcloud.com/user-139188615/dr-sean-martin-the-low-down-on-luts>
- <http://exerciseismedicine.com.au/wp-content/uploads/2016/11/2014-Prostate-Cancer-FULL.pdf>
- <https://www.youtube.com/watch?v=gjsU9Up4eyw>
- <https://www.abc.net.au/news/2018-05-07/cancer-patients-engaging-in-exercise-show-improvement/9733882>
- <https://www.independent.co.uk/life-style/health-and-families/health-news/prostate-cancer-new-study-examines-how-exercise-affects-survival-rates-a6798311.html>

Please note that the Real Men Move Website is not longer available (May 2019)




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[config](#)
[tags](#)

[Tags](#)
[All items](#)
[Barrier](#)

## Exercise Videos: Follow along at home

Click on the links and it will take you to a youtube video tutorial.



### Exercises using own body weight

<a href="#">All fours arm raise</a>	<a href="#">Single leg lift with extension</a>
<a href="#">All fours arm and leg raise</a>	<a href="#">Single leg lift</a>
<a href="#">All fours single leg extension</a>	<a href="#">Leg foldout</a>
<a href="#">Knelling plank</a>	<a href="#">Double leg lift</a>
<a href="#">Semi-squat</a>	<a href="#">Seated march</a>
<a href="#">Full squat</a>	<a href="#">Incline push up</a>
<a href="#">Sit to stand</a>	<a href="#">Abdominal Braces</a>
<a href="#">Double leg hip lift</a>	<a href="#">Standing calf raise</a>

### Exercising using a resistance band/cord

- Using a resistance band or cord can act as several types of equipment at once
- They can come in cords or bands. Sometimes with handles on the ends (good for arthritis).
- You can buy them.
  - Ask a physio clinic if they sell them - Find a list of physiotherapists [here](#), and find exercise physiologists who specialise in cancer [here](#)
  - Kmart, Big W and Target all sell them, as well as specialist sports stores like Rebel sport.

<b>Sitting exercises</b> <ul style="list-style-type: none"> <li><a href="#">Seated chest press</a></li> <li><a href="#">Seated leg curl</a></li> <li><a href="#">Seated bicep curl</a></li> <li><a href="#">Seated row</a></li> <li><a href="#">Seated shoulder press</a></li> <li><a href="#">Seated shoulder raise</a></li> <li><a href="#">Seated tricep extension</a></li> </ul>	<b>Standing exercises</b> <ul style="list-style-type: none"> <li><a href="#">Standing bicep curl</a></li> <li><a href="#">Standing chest press</a></li> <li><a href="#">Standing row</a></li> <li><a href="#">Standing shoulder press</a></li> </ul>
--	--

### *Examples of the Video Content*

- <https://www.youtube.com/watch?v=DoNfsBmsFi4&feature=youtu.be>
- [https://www.youtube.com/watch?v=Eta16\\_yq0t8&feature=youtu.be](https://www.youtube.com/watch?v=Eta16_yq0t8&feature=youtu.be)



squat bodyweight 720

Unlisted

## Example of final week feedback survey

PROSTATE

HEALTH AND

FITNESS ONLINE

CANCER

HOME ABOUT LIBRARY ASK AN EXPERT

activity - surveys pages - library users groups reminders config tags

Physical Activity Log Week 4

Moderate activity

edit #3

For example

- Walking as if you were late for an appointment (brisk walking), often more than 10 mins at a time
- Dancing, playing games with children
- Gardening, light digging, planting, weeding
- Walking the dog, or other animals
- Household tasks, washing windows, mopping floors
- Lawn mowing with a powered lawn mower
- Gentle swimming

In the last week, how many minutes of moderate activity do you think you did?

20 mins

Vigorous Activity

edit #4

This type of activity makes you start huffing and puffing pretty quickly. You sweat and your heart rate goes up

- Gardening where you're lifting, digging and shovelling, wheel burrowing or pulling down heavy branches and mulching
- Fast walking
- Moderate-swimming
- Skiing
- Going up hills/ hiking
- Basketball
- Quick cycling
- Aerobics
- Jogging

In the last week, how many minutes of vigorous activity do you think you did?

1 hour

## Example of Physical Activity Feedback



